

Xi Advanced Electronics for Zirconium Oxide Flue Gas O₂ Probes



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Xi Advanced Electronics for Zirconium Oxide Flue Gas O₂ Probes

READ THIS PAGE BEFORE PROCEEDING!

ESSENTIAL INSTRUCTIONS

Emerson Process Management designs, manufactures and tests its products to meet many national and international standards. Because these instruments are sophisticated technical products, **you MUST properly install, use, and maintain them** to ensure they continue to operate within their normal specifications. The following instructions **MUST be adhered to** and integrated into your safety program when installing, using, and maintaining Rosemount Analytical products. Failure to follow the proper instructions may cause any one of the following situations to occur: Loss of life; personal injury; property damage; damage to this instrument; and warranty invalidation.

- **Read all instructions** prior to installing, operating, and servicing the product.
- If you do not understand any of the instructions, **contact your Emerson Process Management representative** for clarification.
- **Follow all warnings, cautions, and instructions** marked on and supplied with the product.
- Inform and educate your personnel in the proper installation, operation, and maintenance of the product.
- **Install your equipment as specified in the Installation Instructions of the appropriate Instruction Manual and per applicable local and national codes.** Connect all products to the proper electrical and pressure sources.
- To ensure proper performance, **use qualified personnel** to install, operate, update, program, and maintain the product.
- When replacement parts are required, ensure that qualified people use replacement parts specified by Emerson Process Management. Unauthorized parts and procedures can affect the product's performance, place the safe operation of your process at risk, **and VOID YOUR WARRANTY.** Look-alike substitutions may result in fire, electrical hazards, or improper operation.
- **Ensure that all equipment doors are closed and protective covers are in place, except when maintenance is being performed by qualified persons, to prevent electrical shock and personal injury.**

The information contained in this document is subject to change without notice.

NOTES:

The 375 Field Communicator must be upgraded to System Software 2.0 with Graphic License for operation with the Xi Electronics. The AMS software must be upgraded to AMS 8.0 or above.

Contact Emerson Process Management's Global Service Center (GSC) at 1-800-833-8314 to upgrade the 375 Field Communicator software to System Software 2.0 with Graphic License.

Section i Introduction

Preface	page iii
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PREFACE

The purpose of this manual is to provide information concerning components, functions, installation and maintenance of the Xi Electronics.


Some sections may describe equipment not used in your configuration. The user should become thoroughly familiar with the operation of this module before operating it. Read this instruction manual completely.

DEFINITIONS

The following definitions apply to WARNINGS, CAUTIONS, and NOTES found throughout this publication.

 **WARNING**

Highlights an operation or maintenance procedure, practice, condition, statement, etc. If not strictly observed, could result in injury, death, or long-term health hazards of personnel.





 **CAUTION**

Highlights an operation or maintenance procedure, practice, condition, statement, etc. If not strictly observed, could result in damage to or destruction of equipment, or loss of effectiveness.

NOTE

Highlights an essential operating procedure, condition, or statement.

SYMBOLS

-  : EARTH (GROUND) TERMINAL
-  : PROTECTIVE CONDUCT OR TERMINAL
-  : RISK OF ELECTRICAL SHOCK
-  : WARNING: REFER TO INSTRUCTION MANUAL

NOTE TO USERS

The number in the lower right corner of each illustration in this publication is a manual illustration number. It is not a part number, and is not related to the illustration in any technical manner.

OVERVIEW

The Xi is specifically designed to control a zirconium oxide probe for measuring oxygen, usually the O₂ remaining from a combustion process. Call the Rosemount Analytical Customer Support Center (CSC) in Solon, Ohio, to get recommendations for other oxygen probes. 800-433-6076 (US and Canada).

The Xi electronics has several main functions:

1. **Heater Control** - The electronics receives a type K thermocouple input from an O₂ probe and switches power on and off to the probe's heater in order to maintain a temperature setpoint of 736 degrees C.
2. **Signal Conditioning** - The electronics receives the raw millivolt signal from the O₂ sensing cell, then linearizes and amplifies the signal to provide a linear 4-20 mA output signal used for recording or as an input into a DCS system for control purposes.
3. **Calibration** - A bottled calibration gas of known value is typically flowed into the probe's sensor to verify that it is reading correctly. If the signal is out of calibration, the calibration gas is used to adjust the 4-20 mA output signal. During calibration the Xi prompts the technician to flow two calibration gases into the probe and, with the calibration gases flowing, automatically adjusts the O₂ signal. With the addition of a Single Probe Sequencer (SPS), the Xi electronics can also switch the calibration gases on and off.
4. **Diagnostics** - Multiple alarms are available for display. The alarm displays are intended to assist a technician in locating where an instrument problem may reside.

The Xi electronics has been verified to operate the following probes:

- Westinghouse 218 and World Class
- Rosemount Analytical Oxymitter
- Yokogawa

**Technical Support
Hotline**

For assistance with technical problems, please call the Customer Support Center (CSC). The CSC is staffed 24 hours a day, 7 days a week.

Phone: 1-800-433-6076

1-440-914-1261

In addition to the CSC, you may also contact Field Watch. Field Watch coordinates Emerson Process Management's field service throughout the U.S. and abroad.

Phone: 1-800-654-RSMT (1-800-654-7768)

Emerson Process Management may also be reached via the Internet through e-mail and the World Wide Web:

e-mail: GAS.CSC@emerson.com

World Wide Web: www.raihome.com

Section 1 Description and Specifications

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COMPONENT CHECKLIST

A typical Rosemount Analytical O₂ Combustion Flue Gas Transmitter should contain the items shown in Figure 1-1. A complete Oxygen Analyzer system will include some or all of the equipment shown. However, this manual describes item 8 only. Record the part number, serial number, and order number for the Xi Electronics in the table located on the back cover of this manual.

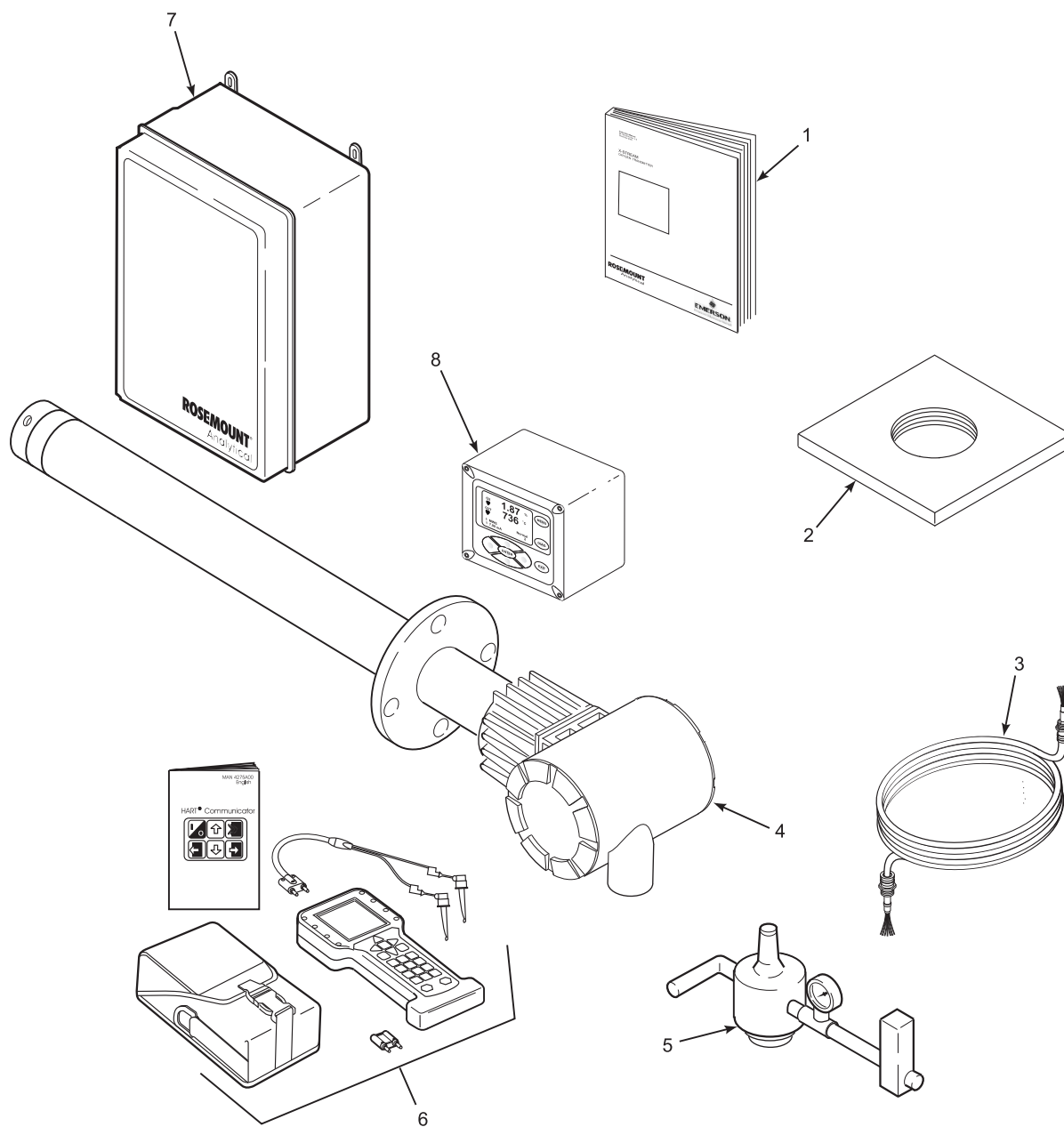
Also, use the product matrix (Table 1-1) at the end of this section to compare your order number against your unit. The first part of the matrix defines the model. The last part defines the various options and features. Ensure the features and options specified by your order number are on or included with the unit.

SYSTEM OVERVIEW

Scope

This Instruction Manual is designed to supply details needed to install, start up, operate, and maintain the Xi Electronics. Signal conditioning electronics outputs a 4-20 mA signal representing an O₂ value. This information, plus additional details, can be accessed with the handheld HART Model 375/475 Field Communicator or Asset Management Solutions (AMS) software.

Figure 1-1. Typical System Package



1. Instruction Manual
2. Weld Plate
3. Traditional Architecture Cable
4. O₂ Probe
5. Reference Air Set (not used if SPS 4001B or IMPS 4000 is used)
6. HART® 375/475 Field Communicator Package (Optional)
7. Optional SPS 4001B or IMPS 4000 Autocalibration Sequencer
8. Xi Advanced Electronics

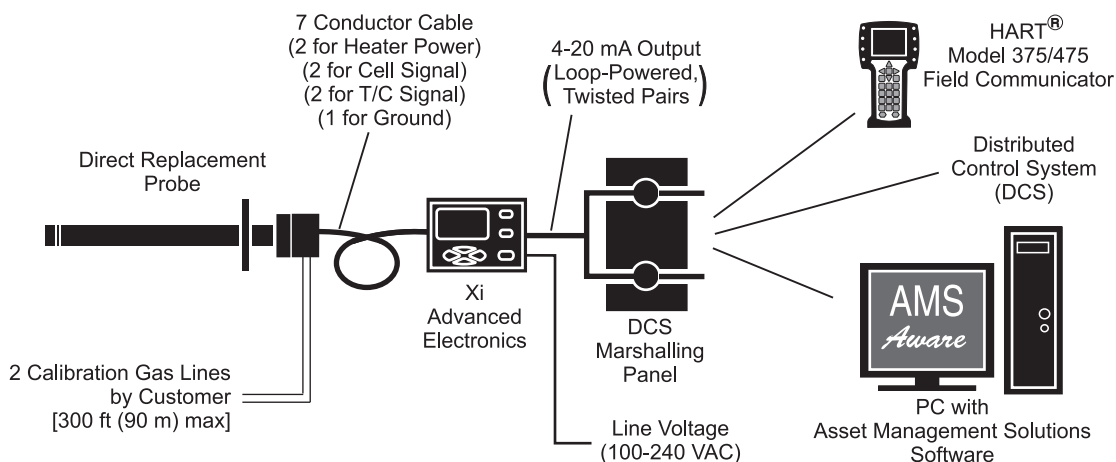
40200001

System Configurations

Traditional Architecture, HART and Xi Communications

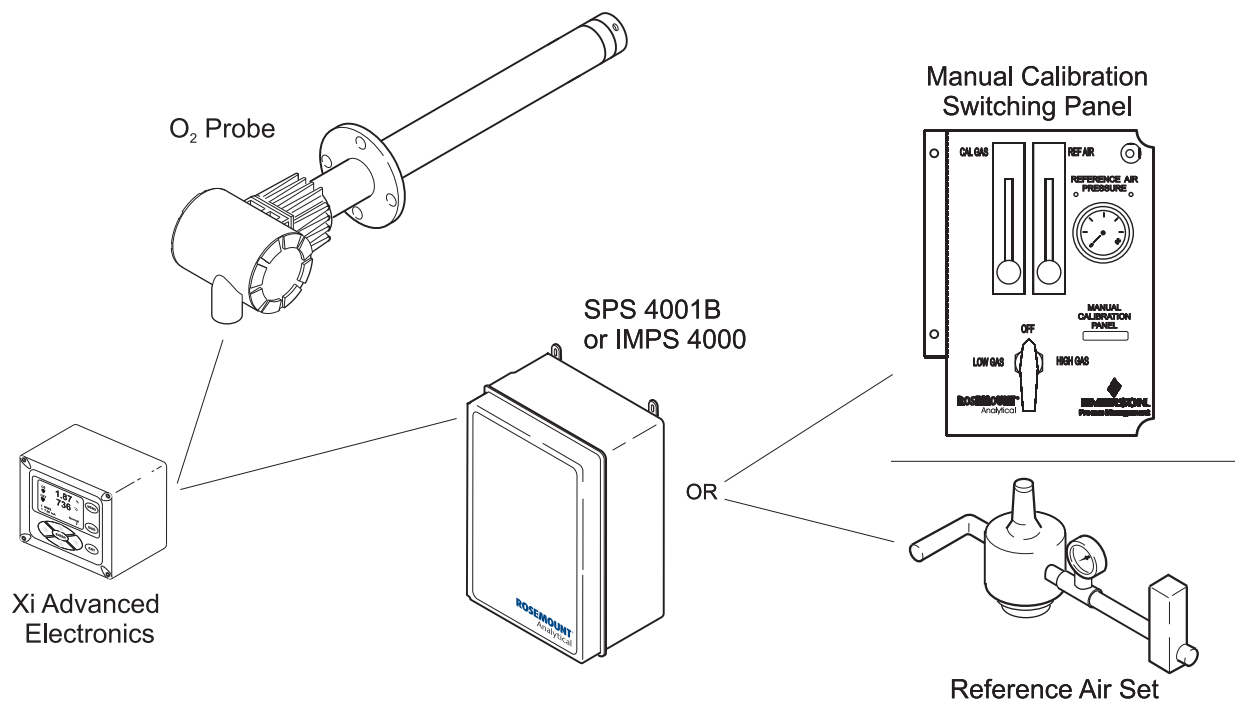
Some customers prefer not to mount electronics onto the probe, so a "traditional architecture" version is offered. This probe sends raw millivolt signals via a 7-conductor cable to the Xi electronics, Figure 1-2, which does all heater control and signal conditioning in addition to its display/keypad functions. The Xi Advanced Electronics is offered to support direct replacement probes with either 120 volt or 44 volt heaters.

Figure 1-2. Direct Replacement Probe with Traditional Architecture Electronics



40200002

Figure 1-3. O₂ Probe with Xi Electronics and Autocalibration Sequencer



40200003

Automatic Calibration

Calibrations consist of introducing bottled gases of known value into the probe so the electronics can make automatic adjustments to the O₂ readings to match the bottled gas value. 0.4% O₂ and 8% O₂ (balance nitrogen) gases are recommended. Never use nitrogen or instrument air as calibration gases.

Flowmeters (for calibration gases) and regulators and flowmeters (for reference air) are available as loose components, mounted into an optional manual calibration switching panel, or as a fully automatic calibration system, Figure 1-3, where calibration solenoids are switched from the Xi Electronics. See IM-106-340AC, SPS 4000B Single Probe Autocalibration Sequencer or IM-106-400IMPS, IMPS 4000 Intelligent Multiprobe Test Gas Sequencer, for additional details.

Communication Options

Data Communications

An operator can configure and troubleshoot the O₂ Probe system in one of two ways:

1. Using the Xi Advanced Electronics the Xi carries the following optional advanced features:
 - Fully automatic calibration
 - Flame safety interface
 - High temperature operation [above 700°C (1292°F) standard temperature].
 - Stoichiometer feature provides the ability to indicate O₂ efficiency when the combustion process goes into reducing conditions (0% O₂).
 - Programmable reference provides enhanced accuracy when measuring at or near O₂ level (20.95% O₂).
2. Using the HART Interface. The Xi's 4-20 mA output line transmits an analog signal proportional to the oxygen level. The HART output is superimposed on the 4-20 mA output line. This information can be accessed through the following:
 - Rosemount Analytical Model 375/475 Field Communicator - The handheld communicator requires Device Description (DD) software specific to the Xi. The DD software will be supplied with many Model 375/475 units but can also be programmed into existing units at most Emerson Process Management service offices. See Section 4, Startup and Operation, for additional information.
 - Personal Computer (PC) - The use of a personal computer requires AMS software available from Emerson Process Management.
 - Delta V and Ovation Distributed Control System (DCS) with AMS-inside capability.

NOTE:

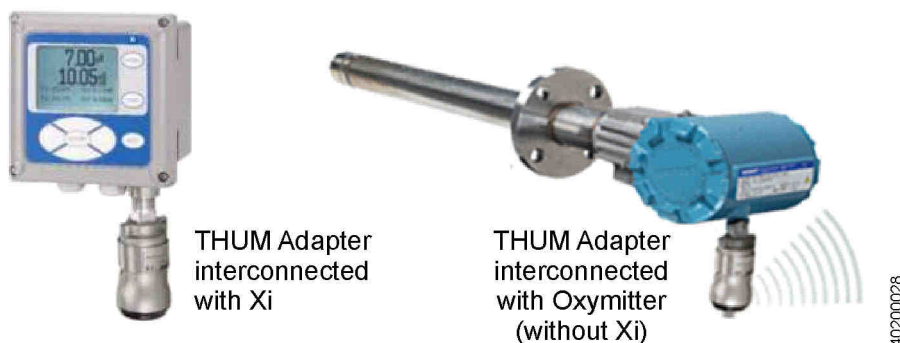
The 375 Field Communicator must be upgraded to System Software 2.0 with Graphic License for operation with the Xi. The AMS software must be upgraded to AMS 8.0 or above.

Contact Emerson Process Management's Global Service Center (GSC) at 1-800-833-8314 to upgrade the 375 Field Communicator software to System Software 2.0 with Graphic License.

3. The Xi can also transmit HART information wirelessly via a wireless THUM Adapter, Figure 1-4. The THUM Adapter threads into the Xi conduit port and converts the 4-20 mA O₂ signal to a wireless protocol. All other HART information is also transmitted.

In addition to the wireless THUM Adapter, a hard-wire connection of the 4-20 mA signal to the DCS may be used at the same time. More detailed information regarding the application of the THUM Adapter is available in Product Data Sheet 00813-0100-4075. Note that the THUM Adapter may also be used with the Oxymitter, mounted integral to the probe, or to the Oxymitter remote electronics.

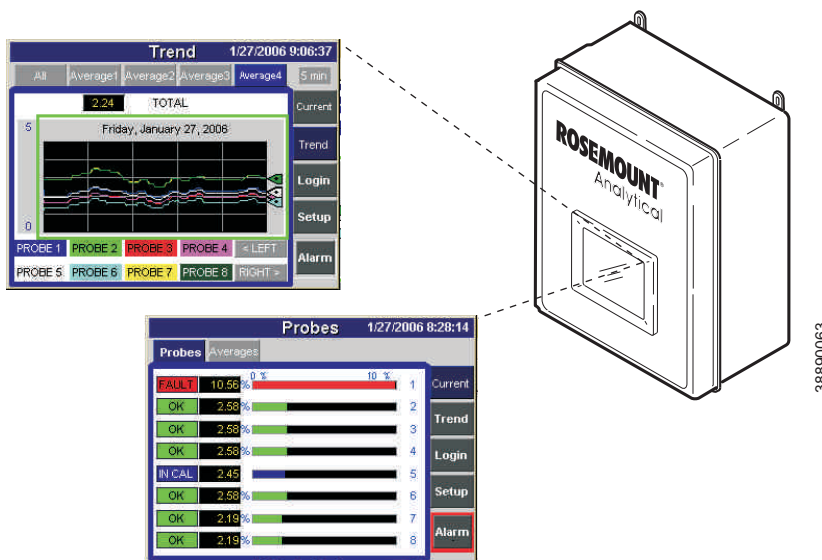
Figure 1-4. Wireless THUM Adapter



Optional OxyBalance Display and Averaging System

Receives up to eight 4-20 mA signals from individual Xi units. Trends individual outputs and calculates four programmable averages as additional 4-20 mA outputs. OxyBalance graphic displays are shown in Figure 1-5. See IM-106-4050, OxyBalance Oxygen Display and Averaging System, for additional details.

Figure 1-5. OxyBalance Displays



SPECIFICATIONS

Measurement Specifications

Net O ₂ Range:	0 to 50% O ₂ user scalable -2 to 50% O ₂ user scalable with stoichiometer
Lowest Detectable Limit:	0.01% O ₂
Signal Stability:	±0.03% O ₂
Accuracy in Reducing Conditions:	±10% of reading or 0.1% O ₂
System Response in Reducing Conditions:	going from oxidizing to reducing -T ₉₀ in 120 seconds going from reducing to oxidizing -T ₉₀ in 30 seconds
Ambient Temperature Effect on Xi 4-20 mA Signal:	less than 0.0025% O ₂ per degree Celsius

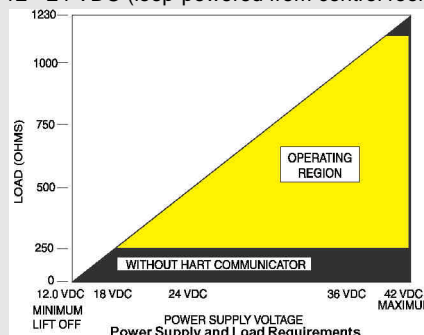
Environmental Specifications

Xi Advanced Electronics:	Type 4X/IP66, Polycarbonate Material
Ambient Temperature Limits:	-20°C to 50°C (-4°F to 122°F) -20°C to 70°C (-4°F to 158°F) as measured by electronics
Xi LCD display:	
Ambient Temperature Limits:	-20°C to 55°C (-4°F to 131°F)
General Purpose Certifications:	



Installation Specifications

Mounting:	Panel, wall, or pipe.
Reference Air:	0.5 scfh (0,25 l/min), clean, dry, instrument-quality air (20.95% O ₂), regulated to 5 psi (34 kPa)
Calibration:	Semi-automatic or automatic
Cal Gases:	0.4% O ₂ and 8% O ₂ , balance N ₂
Traditional Architecture Cable	200 ft (61 m) maximum length
Transmitter Electrical Power:	12 - 24 VDC (loop-powered from control room or Xi)



Electrical Power for Xi:	100-240VAC ±10%, 50/60 Hz
Power Consumption of Xi:	12 VA maximum or 776 VA maximum with Traditional Architecture, 120V Probes 450VA maximum with Traditional Architecture, 44V Probes
Alarm Relay Outputs:	Two provided - 2 Amperes, 30 VDC, Form-C
Optional Loss of Flame Input:	Internally powered input to remove heater power actuated via dry contact output from user's* flame scanner



Emerson Process Management has satisfied all obligations from the European legislation to harmonize the product requirements in Europe. ¹All static performance characteristics are with operating variables constant. Specifications subject to change without notice.

Instruction Manual

IM-106-910Xi, Original Issue

November 2010

Xi Advanced Electronics

Table 1-1. Product Matrix, Xi Advanced Electronics

Xi		Xi Advanced Electronics																								
								<table><tr><th>Code</th><th>Remote Type</th></tr><tr><td>01</td><td>Single Channel ⁽¹⁾</td></tr><tr><td>02</td><td>Single Channel, accepting a loss-of-flame input to remove heater power with flame status relay⁽¹⁾</td></tr><tr><td>03</td><td>Dual Channel ⁽¹⁾</td></tr><tr><td>04</td><td>Single Channel Traditional Architecture for 120V probes</td></tr><tr><td>05</td><td>Single Channel Traditional Architecture for 44V probes</td></tr></table>	Code	Remote Type	01	Single Channel ⁽¹⁾	02	Single Channel, accepting a loss-of-flame input to remove heater power with flame status relay ⁽¹⁾	03	Dual Channel ⁽¹⁾	04	Single Channel Traditional Architecture for 120V probes	05	Single Channel Traditional Architecture for 44V probes						
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								05	Single Channel Traditional Architecture for 44V probes																	
								<table><tr><th>Code</th><th>Mounting</th></tr><tr><td>00</td><td>No Hardware</td></tr><tr><td>01</td><td>Panel Mount Kit with Gasket</td></tr><tr><td>02</td><td>2" Pipe/Wall Mount Kit</td></tr></table>	Code	Mounting	00	No Hardware	01	Panel Mount Kit with Gasket	02	2" Pipe/Wall Mount Kit										
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								02	2" Pipe/Wall Mount Kit																	
								<table><tr><th>Code</th><th>Cable</th></tr><tr><td>00</td><td>No Cable</td></tr><tr><td>10</td><td>20' (6 m) Cable</td></tr><tr><td>11</td><td>40' (12 m) Cable</td></tr><tr><td>12</td><td>60' (18 m) Cable</td></tr><tr><td>13</td><td>80' (24 m) Cable</td></tr><tr><td>14</td><td>100' (30 m) Cable</td></tr><tr><td>15</td><td>150' (45 m) Cable</td></tr><tr><td>16</td><td>200' (60 m) Cable</td></tr></table>	Code	Cable	00	No Cable	10	20' (6 m) Cable	11	40' (12 m) Cable	12	60' (18 m) Cable	13	80' (24 m) Cable	14	100' (30 m) Cable	15	150' (45 m) Cable	16	200' (60 m) Cable
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								14	100' (30 m) Cable																	
15	150' (45 m) Cable																									
16	200' (60 m) Cable																									
<table><tr><th>Code</th><th>Stoichiometer Function</th></tr><tr><td>00</td><td>None</td></tr><tr><td>01</td><td>Single Channel (Stoichiometer cell also required in probe)</td></tr><tr><td>02</td><td>Dual Channel (Stoichiometer cell also required in probe)</td></tr></table>	Code	Stoichiometer Function	00	None	01	Single Channel (Stoichiometer cell also required in probe)	02	Dual Channel (Stoichiometer cell also required in probe)																		
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<table><tr><th>Code</th><th>Programmable Reference Function</th></tr><tr><td>00</td><td>None</td></tr><tr><td>01</td><td>Single Channel</td></tr><tr><td>02</td><td>Dual Channel</td></tr></table>	Code	Programmable Reference Function	00	None	01	Single Channel	02	Dual Channel																		
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02	Dual Channel																									
<table><tr><th>Code</th><th>800 Deg C Process Function</th></tr><tr><td>00</td><td>None</td></tr><tr><td>01</td><td>Single Channel</td></tr><tr><td>02</td><td>Dual Channel</td></tr></table>	Code	800 Deg C Process Function	00	None	01	Single Channel	02	Dual Channel																		
Code	800 Deg C Process Function																									
00	None																									
01	Single Channel																									
02	Dual Channel																									
Xi	01	01	00	01	01	01	Example																			

Note:

⁽¹⁾ Requires external XPS Transmitter, P/N 6A00358G03.

Table 1-2. Product Matrix, O₂ Autocalibration Accessories

O2CAL	O ₂ Autocalibration Accessories	
	Code	Single Probe Sequencers Autocalibration Options
	00	None
	01	SPS 4001B Single Probe Sequencer, general purpose NEMA 4X, includes check valve for probe
	Code	Intelligent Multiprobe Sequencers (IMPS)
	00	None
	01	IMPS single-probe, general purpose NEMA 4X, includes check valve for probe
	02	IMPS two-probe, general purpose NEMA 4X, includes check valve for probe
	03	IMPS three-probe, general purpose NEMA 4X, includes check valve for probe
	04	IMPS four-probe, general purpose NEMA 4X, includes check valve for probe
	05	IMPS single-probe, 115V heated general purpose NEMA 4X, includes check valve for probe
	06	IMPS two-probe, 115V heated general purpose NEMA 4X, includes check valve for probe
	07	IMPS three-probe, 115V heated general purpose NEMA 4X, includes check valve for probe
	08	IMPS four-probe, 115V heated general purpose NEMA 4X, includes check valve for probe
	09	IMPS single-probe, 220V heated general purpose NEMA 4X, includes check valve for probe
	10	IMPS two-probe, 220V heated general purpose NEMA 4X, includes check valve for probe
	11	IMPS three-probe, 220V heated general purpose NEMA 4X, includes check valve for probe
	12	IMPS four-probe, 220V heated general purpose NEMA 4X, includes check valve for probe
O2CAL	00	04
Example		

Table 1-3. Calibration Gases

Part Number	Description
1A99119G01	Two disposable calibration gas bottles - 0.4% and 8% O ₂ , balance nitrogen - 550 liters each*
1A99119G02	Two flow regulators for calibration gas bottles
1A99119G03	Bottle rack

Note:

*Calibration gas bottles cannot be shipped via airfreight.

Section 2 **Installation**

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Electrical Installation	page 2-5
Xi Advanced Electronics	page 2-5
Optional Flame Safety Interlock	page 2-7
Traditional Architecture Cable Connections	page 2-7

⚠ WARNING

Before installing this equipment read the "Safety instructions for the wiring and installation of this apparatus" at the front of this Instruction Manual. Failure to follow safety instructions could result in serious injury or death.

⚠ WARNING

Install all protective equipment covers and safety ground leads after installation. Failure to install covers and ground leads could result in serious injury or death.

⚠ WARNING

The Xi Advanced Electronics can be installed in general purpose areas only. Do not install the Xi in hazardous areas or in the vicinity of flammable liquids.

⚠ CAUTION

If external loop power is used, the power supply must be a safety extra low voltage (SELV) type.

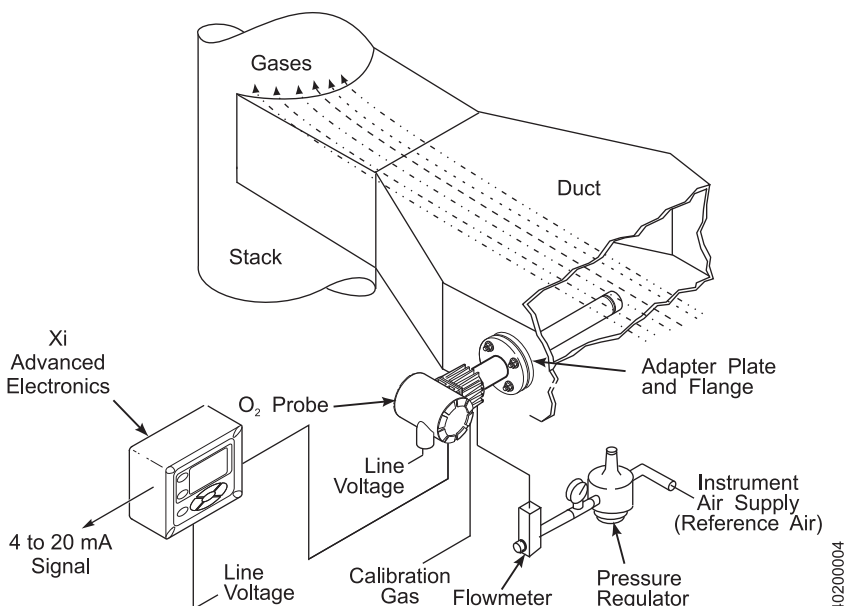
NOTE

All unused ports on the probe housing and Xi enclosure should be plugged with a suitable fitting.

SYSTEM CONSIDERATIONS

A typical system installation for a Xi and O₂ Probe is shown in Figure 2-1.

Figure 2-1. Typical System Installation



MECHANICAL INSTALLATION

Xi Advanced Electronics

The Xi Advanced Electronics is available in a panel mounting, wall mounting, or pipe mounting configuration. Refer to Figure 2-2 or Figure 2-3 for the panel, wall, or pipe mounting details.

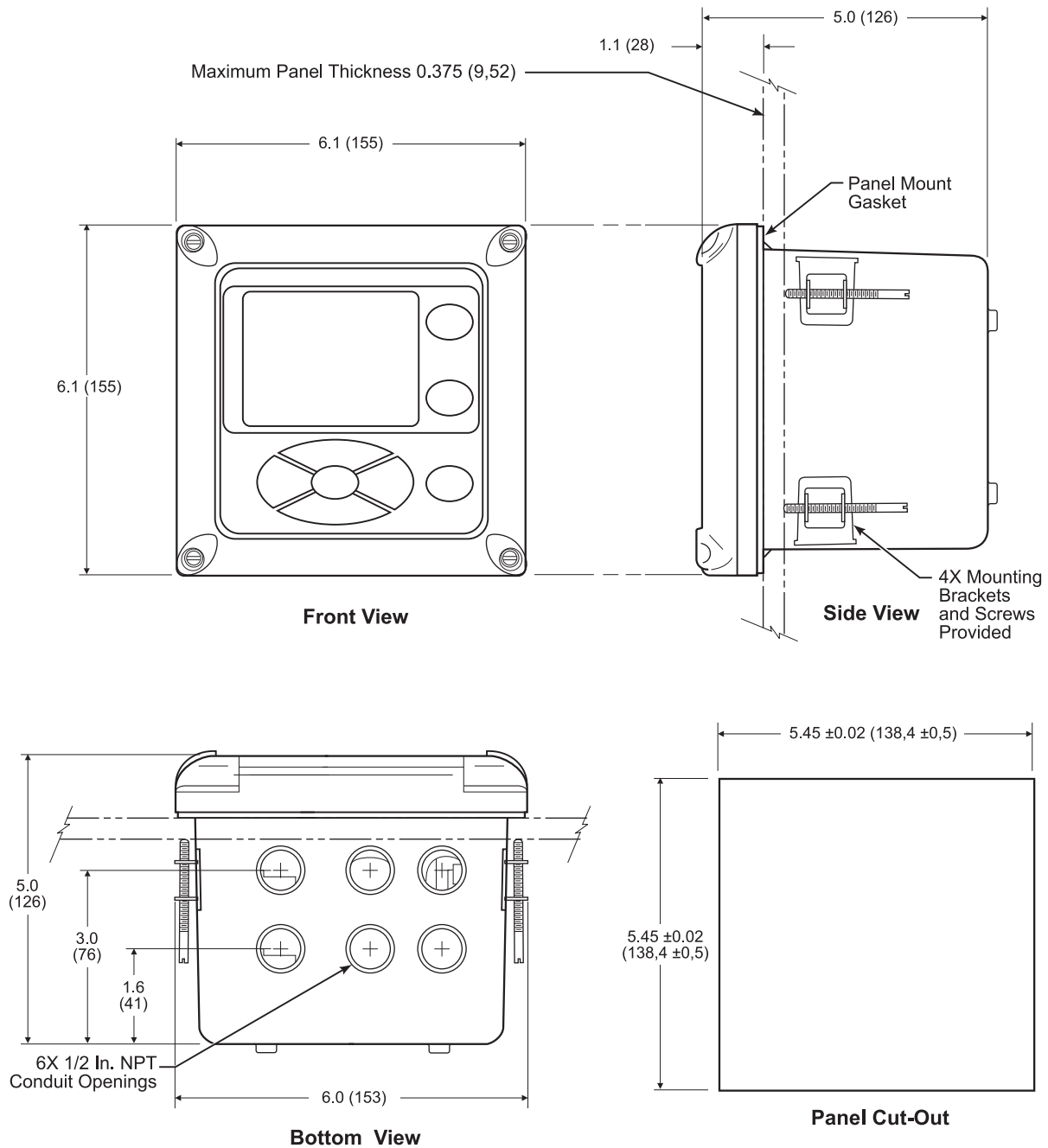
1. Ensure all components are available to install the Xi.
2. Select a mounting location near or removed from the O₂ Probe. Consider the temperature limitations of the Xi (see "Specifications") when selecting the mounting location.
3. Mount the Xi at a height convenient for viewing and operating the interface. Approximately 5 ft (1,5 m) is recommended.
4. The keypad window on the Xi may have interior and exterior protective membranes. Remove the protective membranes prior to use of the Xi enclosure. Failure to remove the protective membranes may cause the display to appear distorted. The membrane may be difficult or impossible to remove after extended use at elevated temperatures.

Instruction Manual

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Xi Advanced Electronics

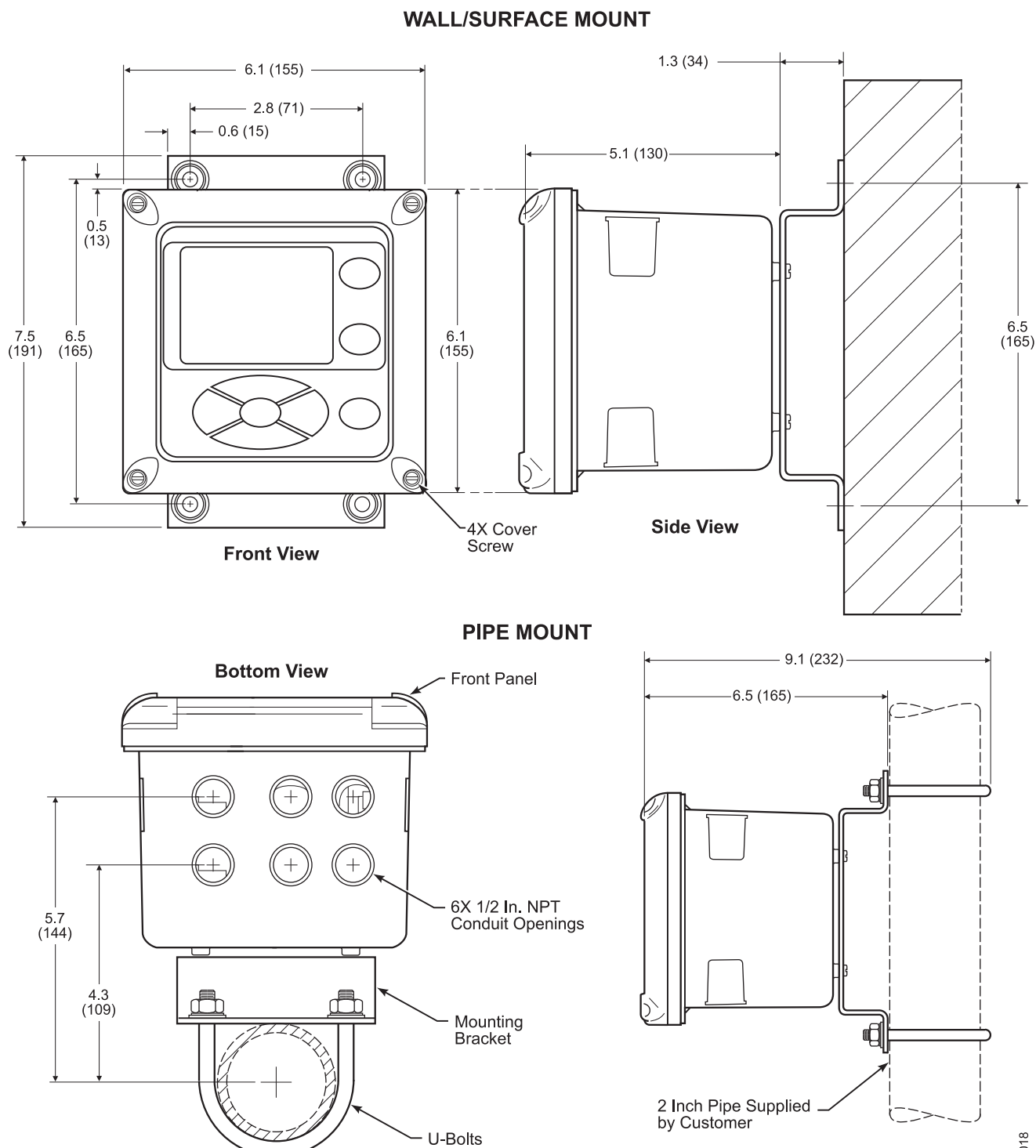
Figure 2-2. Xi Advanced Electronics - Panel Mounting Details



- NOTES: 1. Dimensions are in inches with millimeters in parentheses.
2. The front panel is hinged at the bottom. The panel swings down for easy access to the wiring locations.

39410019

Figure 2-3. Xi Advanced Electronics - Wall/Surface and Pipe Mounting Details



39410018

ELECTRICAL INSTALLATION

All wiring must conform to local and national codes. Multiple wiring diagrams are shown in this section. Always refer to the diagrams that apply to your transmitter configuration and disregard all other wiring diagrams.

Xi Advanced Electronics

⚠ WARNING

Disconnect and lock out power before connecting the power supply.

⚠ WARNING

Install all protective covers and safety ground leads after installation. Failure to install covers and ground leads could result in serious injury or death.

⚠ WARNING

To meet the Safety Requirements of IEC 1010 (EC requirement), and ensure safe operation of this equipment, connection to the main electrical power supply must be made through a circuit breaker (min 10A) which will disconnect all current-carrying conductors during a fault situation. This circuit breaker should also include a mechanically operated isolating switch. If not, then another external means of disconnecting the supply from the equipment should be located close by. Circuit breakers or switches must comply with a recognized standard such as IEC 947.

NOTE

Line voltage, signal, and relay wiring must be rated for at least 105°C (221°F).

NOTE

If metal conduit is used with the Xi the conduit should be reliably bonded to protective earth. The grounding plate inside the Xi is not bonded to PE and does not provide adequate grounding.

1. Remove cover screws from the front cover of the Xi. Swing down the front cover of the interface box.
2. Pull out the I/O board on the right-hand side of the card rack inside the Xi. If your system is configured to operate two transmitter probes there are two I/O interface boards.
3. See Figure 2-4. Connect the 4-20 mA signal wires at J4 of the I/O board. Attach the supplied ferrite clamp over the 4-20 mA OUT wires that extend past the shield.

NOTE

Installation of the ferrite clamp over the 4-20 mA OUT wires is required for compliance with the European EMC Directive.

Figure 2-4. Signal Connections at I/O Board

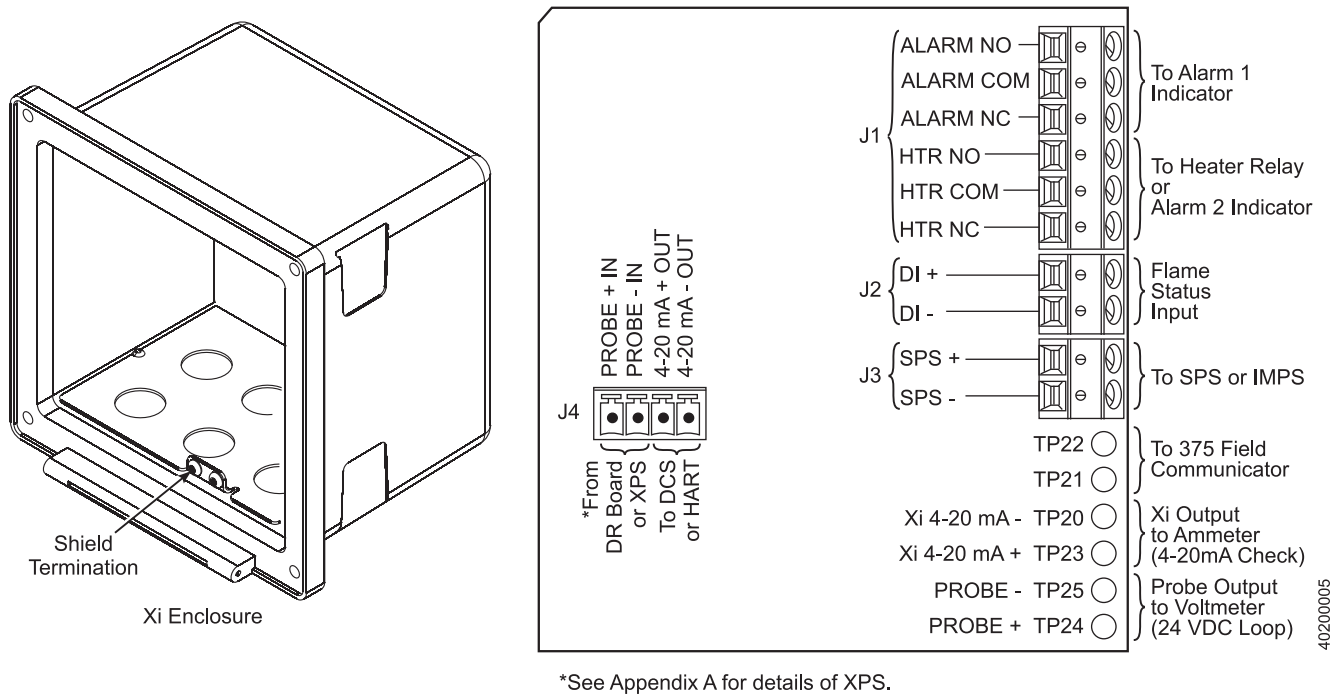
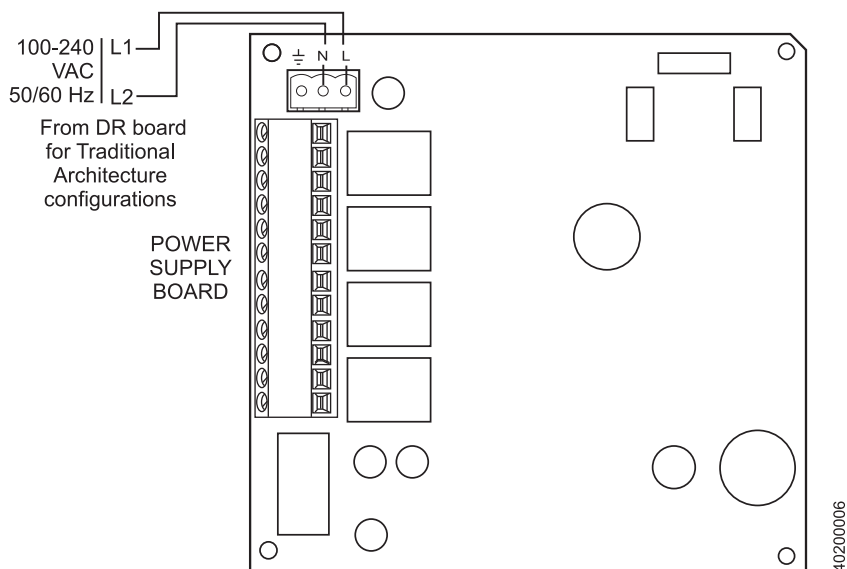


Figure 2-5. Alarm Indicator Relay Terminals



4. Terminate the shield of the 4-20 mA signal wires at the designated ground terminal of the Xi. Do not allow bare shield wires to contact the circuit boards. Insulate the shield wires prior to termination.
5. Connect the signal wires from the SPS or IMPS (if used) to the applicable terminals of J3. Refer to the SPS or IMPS instruction manual for wiring details.
6. Connect the signal wires for the flame status input (if used) to the applicable terminals of J2. The flame status sensing device is supplied by the customer. Refer to the applicable OEM documents for signal wiring details.
7. Connect the customer's alarm indicator devices to the alarm indicator relay terminals. See Figure 2-5 for the alarm indicator relay terminals.
8. Reinstall the I/O board in the card rack of the Xi.

Figure 2-6. Power Connections -
Xi Advanced Electronics



9. If your system is configured for two channel operation, repeat steps 2 through 7 to connect the other signal wires.
10. Remove the connector from the power supply board located on the left-hand side of the card rack inside the Xi.
11. See Figure 2-6. Connect the line, or L1 wire to the L1 terminal and the neutral, or L2 wire, to the N terminal.
12. Reinstall the power supply connector in the power supply board.
13. Close and fasten the Xi cover.

Optional Flame Safety Interlock

A flame safety interlock by Emerson Process Management is available for heater power disconnect whenever there is a loss of the process flame or a heater runaway condition (heater over-temperature) in the O₂ Probe. A simplified wiring diagram for the flame safety interlock is shown in Figure 2-7. This input is internally powered by the Xi and is actuated via a dry contact output from the user's flame scanner. A closed contact indicates a flame is present. An open contact indicates a loss of flame.

Traditional Architecture Cable Connections

A traditional architecture configuration is used to provide for remote location of the transmitter electronics. All electronics are housed inside the Xi. A multi-conductor power/signal cable connects between the probe and the Xi. Use the following procedure to connect the traditional architecture probe to the Xi.

NOTE

The Traditional Architecture cable is provided at the specified length and is ready for installation. The cable glands must be properly terminated to maintain EMC/EMI noise protection.

1. Run the 7-conductor cable between the traditional architecture probe and the installation site for Xi. Use new cable conduit or trough as needed.

Figure 2-7. Flame Safety Interlock - Wiring Diagram

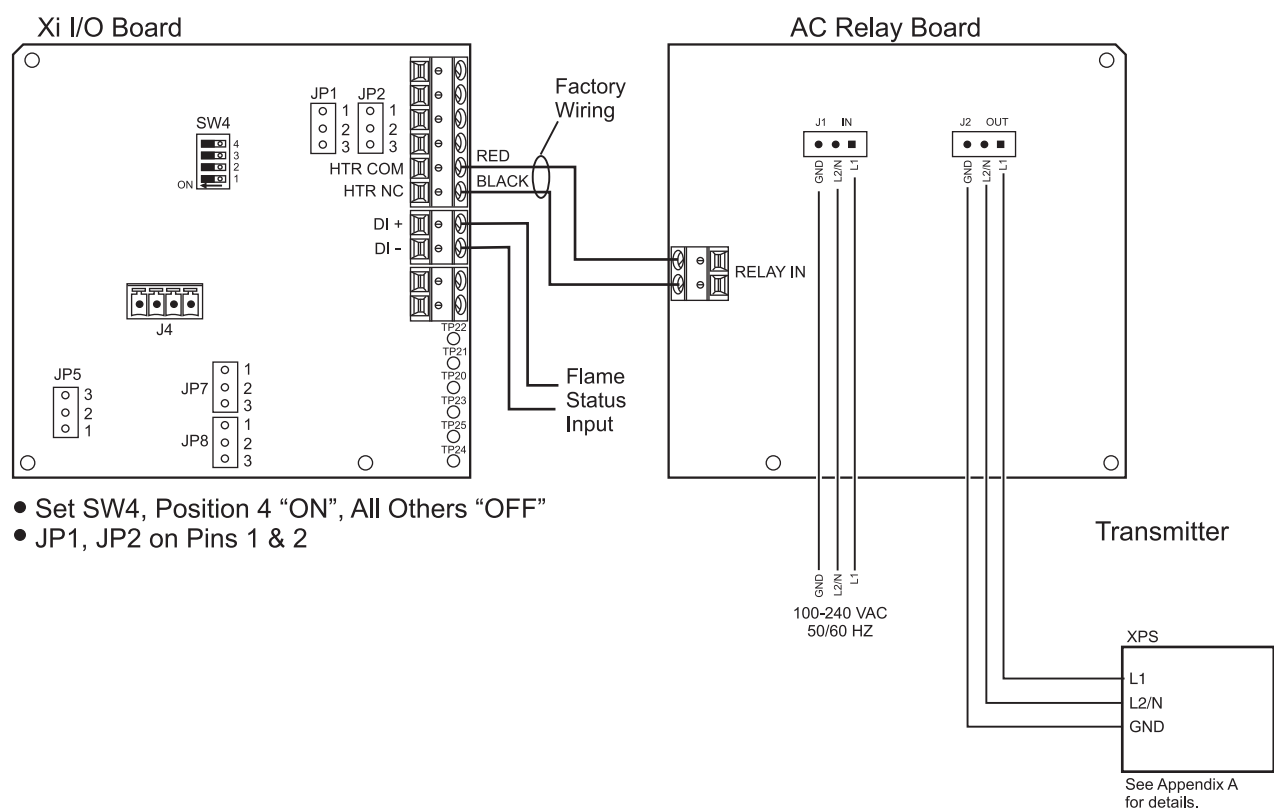
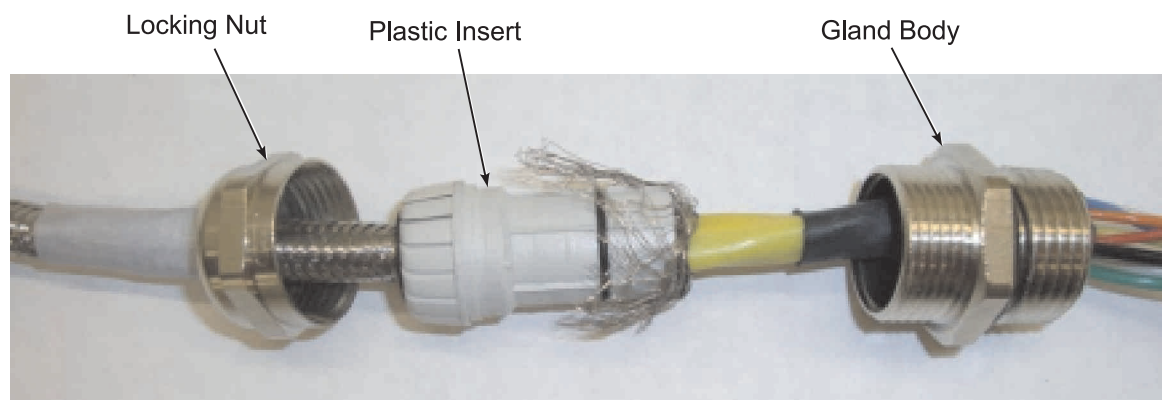


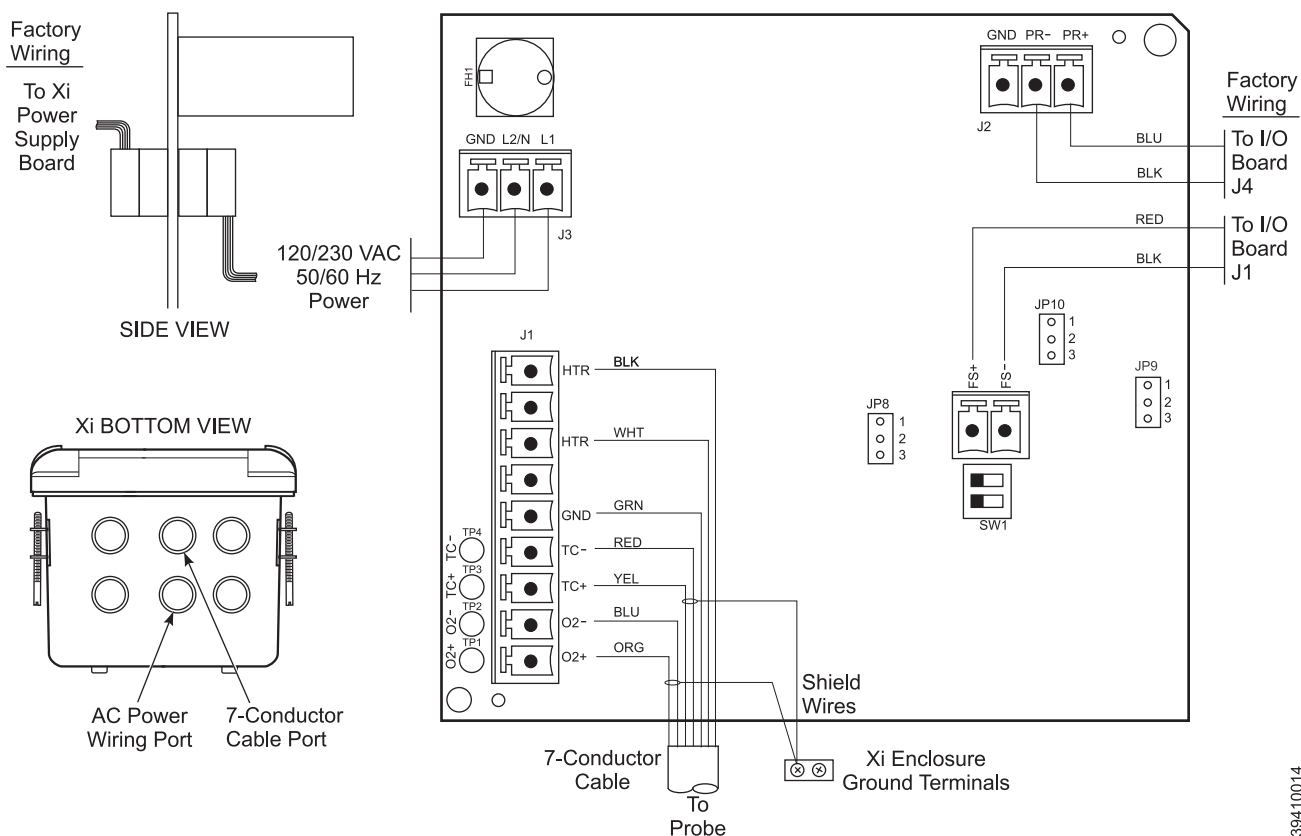
Figure 2-8. Traditional Architecture Cable Gland Assembly



2. Install the cable and lead wires to the probe per manufacturer's instructions.
3. Install the cable at the probe housing and at the Xi enclosure according to the following procedure:
 - a. Unscrew locking nut from gland assembly, Figure 2-8, and slide locking nut back along cable.

- b. Pull the gland body away from the plastic insert. Use care not to damage the cable shield braid.
 - c. Insert the cable wires into the proper entry port in either the probe housing or the Xi enclosure.
 - d. At the probe housing, apply Teflon tape or similar sealing compound to the tapered pipe threads. Thread the gland body into the probe housing until properly seated.
 - e. At the Xi enclosure, insert the gland body into the left front cable port from the inside of the enclosure. Use the rubber O-ring provided to seal the cable port.
 - f. Ensure the cable shield braid is evenly formed over the gray insert. When properly formed, the braid should be evenly spaced around the circumference of the insert and not extend beyond the narrow diameter portion.
 - g. Carefully press the gray insert into the gland body. The grooves on the insert should align with similar grooves inside the gland body. Press the insert in until it bottoms out in the gland body.
 - h. Slide the locking nut up and thread it onto the gland body. Tighten the locking nut so the rubber grommet inside the plastic insert compresses against the cable wall to provide an environmental seal.
4. At the Xi, connect the cable leads to the connectors on the transmitter I/O board as indicated in Figure 2-9.


Figure 2-9. Transmitter Board Connections at Xi - Traditional Architecture



Section 3 Configuration of Xi Electronics

Verify Installation	page 3-1
Xi Configuration	page 3-2
Set Test Gas Values	page 3-2
Alarm Relay Output Configuration	page 3-3
Analog Output Configuration	page 3-4
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Optional Advanced Features Inside the Xi	page 3-6
Extended Process Temperature Range to 800°C	page 3-6
Stoichiometer	page 3-7
Programmable Reference	page 3-7

VERIFY INSTALLATION


WARNING

Install all protective equipment covers and safety ground leads before equipment startup. Failure to install covers and ground leads could result in serious injury or death.


CAUTION

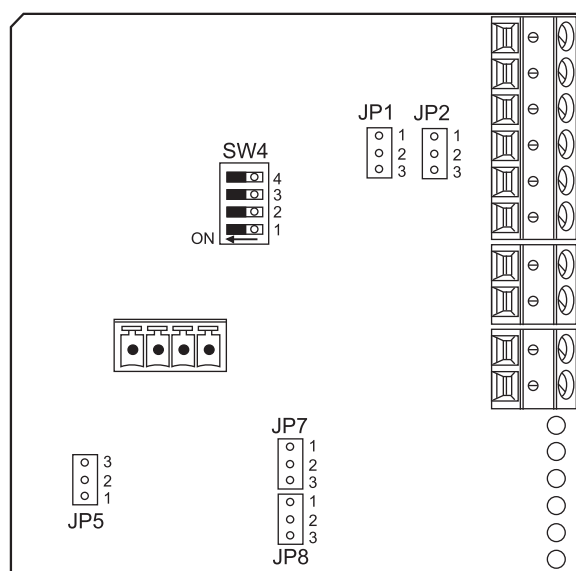
If external loop power is used, the power supply must be a safety extra low voltage (SELV) type.

Xi Configuration

Refer to Figure 3-1 for the configuration of jumpers JP1 through JP8. The jumper configuration for your I/O board depends on the system design and system components used in your installation.

The setting of switch SW4 and the configuration of jumpers JP1 through JP8 must be verified on the I/O board in the Xi. All four dip switches on switch SW4 must be set to the OFF position, as shown.

Figure 3-1. I/O Board Jumper Configuration



Configuration	Desired Selection	Jumper	Jumper Setting
Flame Safety Function or Extra Alarm Output	Flame Safety Function (Factory configured when ordered with Flame Safety Interlock Feature)	JP1 & JP2 (both must be set the same)	Pins 1 & 2
	Extra Alarm Output		Pins 2 & 3
Loop Power for 4-20 mA/HART Signal from Xi to Probe	Powered from Xi (most common method)	JP5	Pins 1 & 2
	Powered from External DC Supply		Pins 2 & 3
Loop Power for 4-20 mA/HART Signal from Xi to DCS	Powered from Xi	JP7 & JP8 (both must be set the same)	Pins 1 & 2
	Powered from DCS		Pins 2 & 3

Sw4 Switch Settings: (Default = OFF)

- 1: Reserved; must remain OFF.
- 2: Not used.
- 3: Not used.
- 4: Flame safety function enable.

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SET TEST GAS VALUES

Use a Field Communicator or the Xi to set test gas values for calibration.

A Xi shipped from the factory has test gas values for low and high set to 0.4% and 8.0% respectively. This same process must be performed any time a replacement Transmitter Board, I/O Board or DR Board is installed.

Setting Test Gas Values Using Xi Keypad/Display

1. Press the MENU button once.
2. From the main menu, select PROBE 1.
3. From PROBE 1, select DETAILED SETUP.
4. From the DETAILED SETUP menu, select CAL SETUP.
5. From CAL SETUP, select Cal Gas 1. Enter the percent O₂ used for the low O₂ test gas.
6. From CAL SETUP, select Cal Gas 2. Enter the percent O₂ used for the high O₂ test gas.
7. Press the LEFT arrow key several times to return to the main menu.
8. Repeat steps 2 through 6 for PROBE 2 if configured for dual channel.

Setting Test Gas Values Using Field Communicator

1. Use the Field Communicator software to access the HART menu.
2. From the DEVICE SETUP menu, select DETAILED SETUP.
3. From the DETAILED SETUP menu, select CAL SETUP.
4. From CAL SETUP, select Cal Gas 1. Enter the percent O₂ used for the low O₂ test gas.
5. From CAL SETUP, select Cal Gas 2. Enter the percent O₂ used for the high O₂ test gas.

ALARM RELAY OUTPUT CONFIGURATION

The Xi has two dry contact Form-C alarm relay output signals that can be configured in eight different modes through the Xi keypad display or the 375/475 Field Communicator. A list of possible configurations is shown in Table 3-1. Each alarm relay output can be configured separately.

If the Xi is configured with the optional Flame Safety Interlock, Alarm 2 is configured with "Heater Relay" and prewired to the AC Relay Board. In this condition the relay configuration cannot be changed to any other setting. If the Xi is not configured with the optional Flame Safety Interlock, "Heater Relay" is not valid and cannot be chosen for Alarm 2.

Table 3-1. Alarm Relay Output Configurations

Mode	Configuration
No Alarm*	The output is not configured for any alarm condition.
Unit Alarm	The output is configured for a Unit Alarm.
Low O ₂ Alarm	The output is configured for a Low O ₂ alarm.
Low O ₂ /Unit Alm	The output is configured for a Unit alarm and a Low O ₂ alarm.
Cal Recommended	The output is configured for a Calibration Recommended display.
Cal Rec/Unit Alm**	The output is configured for a Unit alarm and a Calibration Recommended display.
Low O ₂ /Cal Rec	The output is configured for a Low O ₂ alarm and a Calibration Recommended display.
Low O ₂ /Unit/Cal Rec	The output is configured for a Low O ₂ alarm, a Unit alarm, and a Calibration Recommended display.
Heater Relay	The output is configured for Flame Safety Interlock.

* The default configuration for Alarm 2

** The default configuration for Alarm 1

Configuring Alarm Relays with the Xi Keypad/Display

1. Press the MENU button once.
2. From the main menu, select PROBE 1.
3. From PROBE 1, select DETAILED SETUP.
4. From the DETAILED SETUP menu, select ALARM RELAY.
5. From ALARM RELAY, select as follows:
 - Alm Relay1** - Alarm 1 mode
 - Alm Relay2** - Alarm 2 mode
 - Low O2 Alm SP** - Low O₂ alarm setpoint
 - High Temp Alm SP** - High temperature alarm setpoint
6. Press the LEFT arrow key several times to return to the main menu.
7. Repeat steps 2 through 6 for PROBE 2 if configured for dual channel.

Configuring Alarm Relays with the Field Communicator

1. Use the 375/475 Field Communicator software to access the HART menu.
2. From the DEVICE SETUP menu, select DETAILED SETUP.
3. From the DETAILED SETUP menu, select ALARM RELAY.
4. From ALARM RELAY, select as follows:
Alm Relay1 - Alarm 1 mode
Alm Relay2 - Alarm 2 mode
Low O₂ Alm SP - Low O₂ alarm setpoint
High Temp Alm SP - High temperature alarm setpoint
5. From CAL SETUP, select Cal Gas 2. Enter the percent O₂ used for the high O₂ test gas.

ANALOG OUTPUT CONFIGURATION

The analog output signal from the Xi can be configured for the 4-20 mA range and fault condition.

A Xi shipped from the factory has the analog outputs set to a 4 to 20 mA range with a 3.5 mA alarm level. This same process must be performed any time a replacement Transmitter Board or I/O Board is installed.

Configuring the Analog Output with the Xi Keypad/Display

1. Press the MENU button once.
2. From the main menu, select PROBE 1.
3. From PROBE 1, select DETAILED SETUP.
4. From the DETAILED SETUP menu, select ANALOG OUTPUT.
5. From ANALOG OUTPUT, set the following parameters:

O₂ LRV - O₂ value at the lower analog output value (0 mA or 4 mA)

O₂ URV - O₂ value at the upper analog output value (20 mA)

AO Range - Range of the analog output (0-20 mA or 4-20 mA)

Signal Alarm Level - O₂ alarm level (3.5 mA or 21.1 mA)

Configuring the Analog Output with the Field Communicator

1. Use the 375/475 Field Communicator software to access the HART menu.
2. From the DEVICE SETUP menu, select DETAILED SETUP.
3. From the DETAILED SETUP menu, select ANALOG OUTPUT.
4. From ANALOG OUTPUT, set the following parameters:

O₂ LRV - O₂ value at the lower analog output value (0 mA or 4 mA)

O₂ URV - O₂ value at the upper analog output value (20 mA)

O₂ AO Range - Range of the analog output (0-20 mA or 4-20 mA)

Signal Alarm Level - O₂ alarm level (3.5 mA or 21.1 mA)

AUTOCALIBRATION SETUP

If autocalibration is desired, the Xi must be used with either an SPS 4001B or IMPS 4000. The Xi must be properly configured before autocalibration can take place. Refer to the applicable SPS 4001B or IMPS 4000 instruction manual for details on performing autocalibration. Refer to Section 4, Startup and Operation for details on manual calibration procedures.

A Xi is shipped from the factory without autocalibration configured. This same process must be performed any time a replacement I/O Board is installed.

Configuring Autocalibration with the Xi Keypad/Display

1. Press the MENU button once.
2. From the main menu, select PROBE 1.
3. From PROBE 1, select DETAILED SETUP.
4. From the DETAILED SETUP menu, select CAL SETUP.
5. From CAL SETUP, select Auto Cal.
6. Press the RIGHT arrow key to change the state from NO to YES.

Configuring Autocalibration with the Field Communicator

1. Use the 375/475 Field Communicator software to access the HART menu.
2. From the DEVICE SETUP menu, select DETAILED SETUP.
3. From the DETAILED SETUP menu, select CAL SETUP.
4. From CAL SETUP, select Auto Cal.
5. Press the RIGHT arrow key to change the state from NO to YES.

OPTIONAL ADVANCED FEATURES INSIDE THE Xi

Advanced features available inside the Xi are typically ordered as part of the initial package. However, these advanced features are also available for field retrofit.

A Xi is shipped from the factory with the optional enhanced software features enabled based on the configuration.

WARNING

The I/O Board is shipped from the factory without any of the enhanced software features activated. These features must be activated once the new board has been installed and before the Remote Interface is put into service.

WARNING

If the existing I/O Board has been operated with the Stoichiometric enhanced software feature, this feature must be activated in the new board before the Remote Interface is put back into service. Failure to do so will cause a false analog output signal to the DCS.

NOTE

For enhanced software feature option upgrades or to enable the feature to duplicate the existing configuration, contact Emerson Process Management at 1-800-433-6076. Reference the following:

6A00269G01	Enhanced Software Option Upgrade, Stoichiometric Function
6A00269G02	Enhanced Software Option Upgrade, Programmable Reference Function
6A00269G03	Enhanced Software Option Upgrade, 800°C Process Function

Extended Process Temperature Range to 800°C (1472°F)

The Oxygen Analyzer employs a heater and thermocouple to maintain a temperature setpoint at 736°C (1357°F). Temperature control is maintained within ±1°C to process temperatures of about 705°C (1300°F). This is satisfactory for most applications, but excursions to higher temperatures can occur in some processes. In these instances, the heater is turned off and the process temperature is used to heat the sensing cell.

The oxygen reading is adjusted immediately to compensate for the varying process temperatures. It should be noted that cell life will be reduced by continuous operation at temperatures above 705°C (1300°F). If process temperatures are expected to be continuously above 705°C, we recommend the use of an optional bypass or probe mounting jacket accessory. The extended temperature range feature is selected in the Xi product matrix, but may also be purchased as a field retrofit.

Stoichiometer

Process upsets can sometimes cause a combustion process to go into sub-stoichiometric or reducing conditions. The oxygen readings from one or more probes may decline all the way to zero. The stoichiometer cell will measure the amount of oxygen deficiency during these reducing conditions. The trends in your DCS can be set up for a lower range limit of -1 or -2% oxygen to depict the level of oxygen deficiency.

The operator can see if his control recovery actions are having the desired effect. These types of events do not occur frequently, but knowing the parameters of the situation prevents over-correcting while coming out of the reducing condition. The stoichiometer feature requires purchasing the acid resistant stoichiometer cell and the stoichiometer feature inside the Xi.

NOTE

Make sure the DCS is configured for the same range as the Xi. For instance: -1% O₂ to 10% O₂.

Programmable Reference

The zirconium oxide sensing technology has historically measured process oxygen by using ambient or instrument air as a reference (20.95% oxygen). The sensor develops most of its signal at the low oxygen levels typically found in combustion flue gasses (2-4% oxygen), and is most accurate at these levels. When measuring near 20.95% O₂, the sensor develops only a few millivolts of signal, and accuracy degrades.

The programmable reference feature permits the user to use a bottled reference gas of low oxygen value (0.4% oxygen recommended). When measuring at or near 21% oxygen, a strong negative oxygen signal results, with much improved accuracy. A bottle of reference gas typically lasts about a month at the low flows required. Typical applications would be:

Flue gas recirculation - controlling the mixing of flue gasses into the burner windbox prior ahead of the burner to reduce NO_x emissions.

Moisture monitoring - measuring the amount of moisture coming off of industrial dryers by noting the dilution effect water vapor has on the normal 20.95% ambient drying air. (Non-combustion drying processes only.)

Enriched oxygen concentration - pure oxygen is sometimes mixed in with the combustion air to increase heat at the flame. This is used in steel and other metals reduction processes and in some catalyst regenerators.

Section 4 Startup and Operation

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OVERVIEW

Interface to the Xi for setup, calibration and diagnostics can be via a 375/475 Field Communicator or Asset Management System.

Setup, calibration and diagnostic operations will differ depending on the selected interface for communications with the transmitter.

STARTUP

The O₂ Probe will take approximately 45 minutes to warm up to the 736°C heater setpoint. The 4-20 mA signal will remain at a default value of 3.5 mA through this warm-up period. Once warm, the O₂ probe will be reading oxygen, and the 4-20 mA signal will be reading based on the default range of 0-10% O₂.

NOTE

The Xi offers optional advanced features such as elevated process temperature capability to 800°C, autocalibration via an SPS solenoid box, a stoichiometer feature for indicating the level of oxygen deficiency in reducing conditions, and programmable reference to enhance accuracy at near ambient levels of O₂.

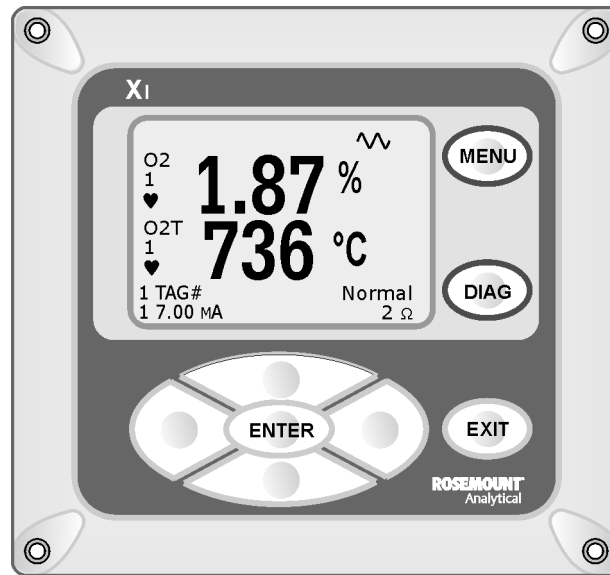
Operation via Xi

The following procedures describe operations using the Xi to set up and calibrate the system. Additional operating instructions are included in the SPS 4001B or IMPS 4000 instruction manual, if applicable to your system.

Startup Display

The O₂ Probe will take approximately 45 minutes to warm up to the 736°C heater setpoint. The 4-20 mA signal will remain at a default value of 3.5 mA through this warm-up period. Once warm, the probe will be reading oxygen and the 4-20 mA signal display will be the 0 to 10% O₂ value.

Figure 4-1. Xi Display (Typical)



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Error Conditions

If there is an error condition at startup, an alarm message will be displayed. Refer to Section 5: Troubleshooting, to determine the cause of the error. Clear the error and cycle power. The %O₂ and temperature display should return less the alarm message.

Xi Controls

The Xi can be used to change the software and alarm settings, to adjust the high and low gas settings, and to initiate the calibration sequence. Refer to the following control descriptions. Use the control keys on the front panel of the Xi, Figure 4-1, to navigate and edit the Xi menu, Figure 4-2.

MENU toggles between three Main menu options: System, Probe1, and Probe2 (if available). The top level of the selected main menu is displayed.

DIAG toggles between the Alarms list of the three main menus. All faults and warnings related to the selected main menu device are displayed.

ENTER saves newly entered data and returns you to previous menu level.

EXIT returns you to the previous menu level without saving newly entered data. When navigating the menu tree, pressing EXIT returns you to the Main menu.

UP/DOWN keys scroll up and down through menu items. During data entry the Up/Down keys increment and decrement the data values.

LEFT arrow key returns you to the previous menu level. During data entry, the left arrow key moves the cursor one digit to the left.

RIGHT arrow key advances you to the next menu level and, when a menu item is highlighted, selects the item from a list of menu options. During data entry, the right arrow key moves the cursor one digit to the right.

Password Protection

Beginning with Xi system software version 1.05 or higher the main display and diagnostic screens of the Xi can be viewed at any time, but further access and unauthorized configuration changes can be prevented by enabling a password protection feature. However, the Xi is shipped with password protection disabled.

Password protection can be enabled by selecting: System Main Menu> Configure> LCD>Enable Password (see the Xi Menu, Figure 4-2).

The factory default upon enabling the password protection is ROSE, but the password can consist of any 4 alpha/numeric characters.

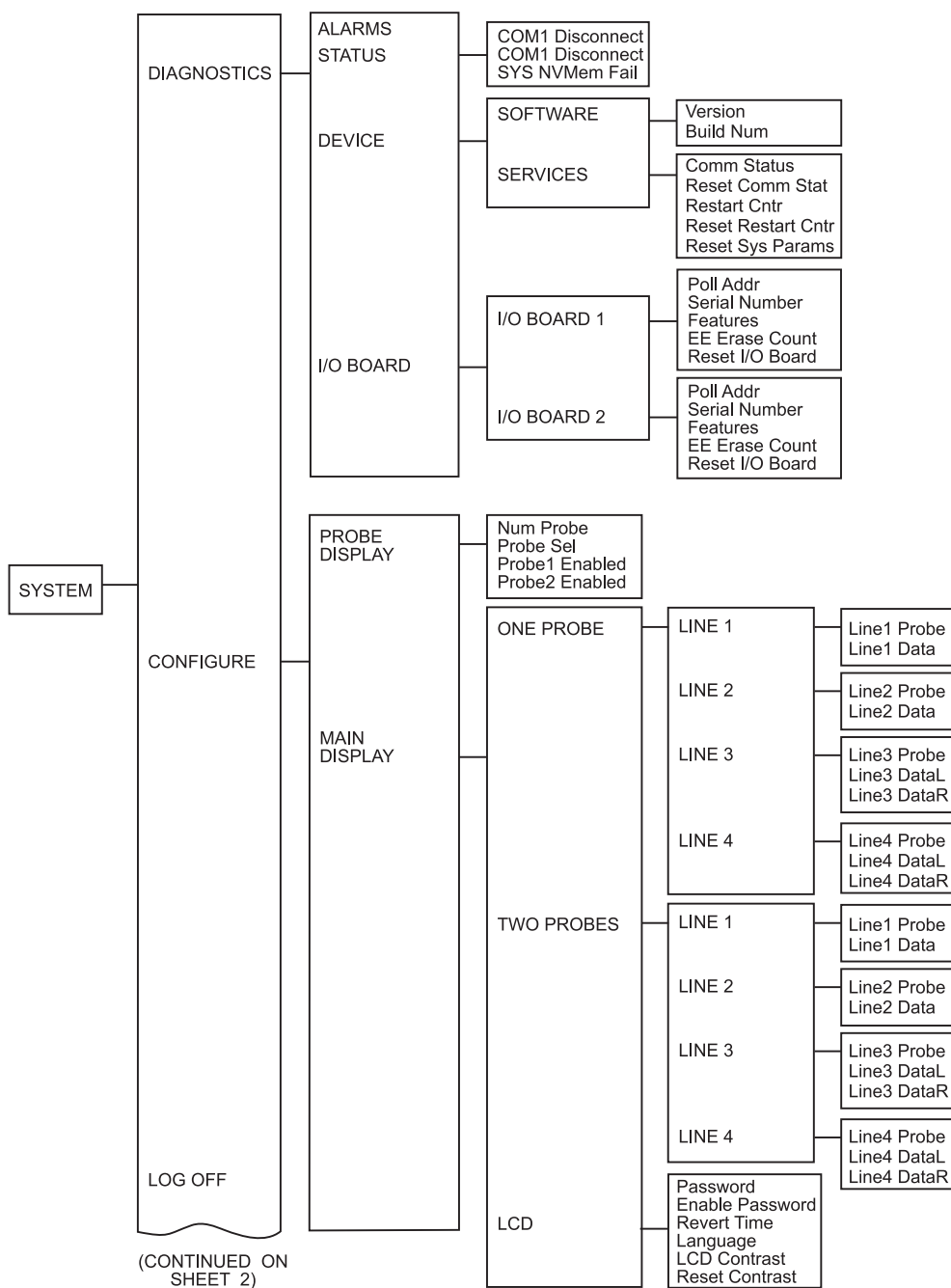
If the user forgets the password, call Rosemount Analytical technical support at 800-433-6076 to gain access to a master password.

A "Lock" icon will be displayed at the top right corner of the main display when password protection is in effect.

The password protection will relock itself after a certain number of seconds with no button pushes (defined as "revert time" in the same "LCD setup" menu). Users can also force the front panel to be locked by selecting System Main Menu >Log Off. The Log Off selection will perform no function if the password feature is disabled.

The Xi has a "Reset" function that reestablishes all factory default conditions, including the password protection feature, i.e. the password protection will fall back to a disabled condition after a reset.

Figure 4-2. Xi Menu (Sheet 1 of 3)



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Figure 4-2. Xi Menu (Sheet 2 of 3)

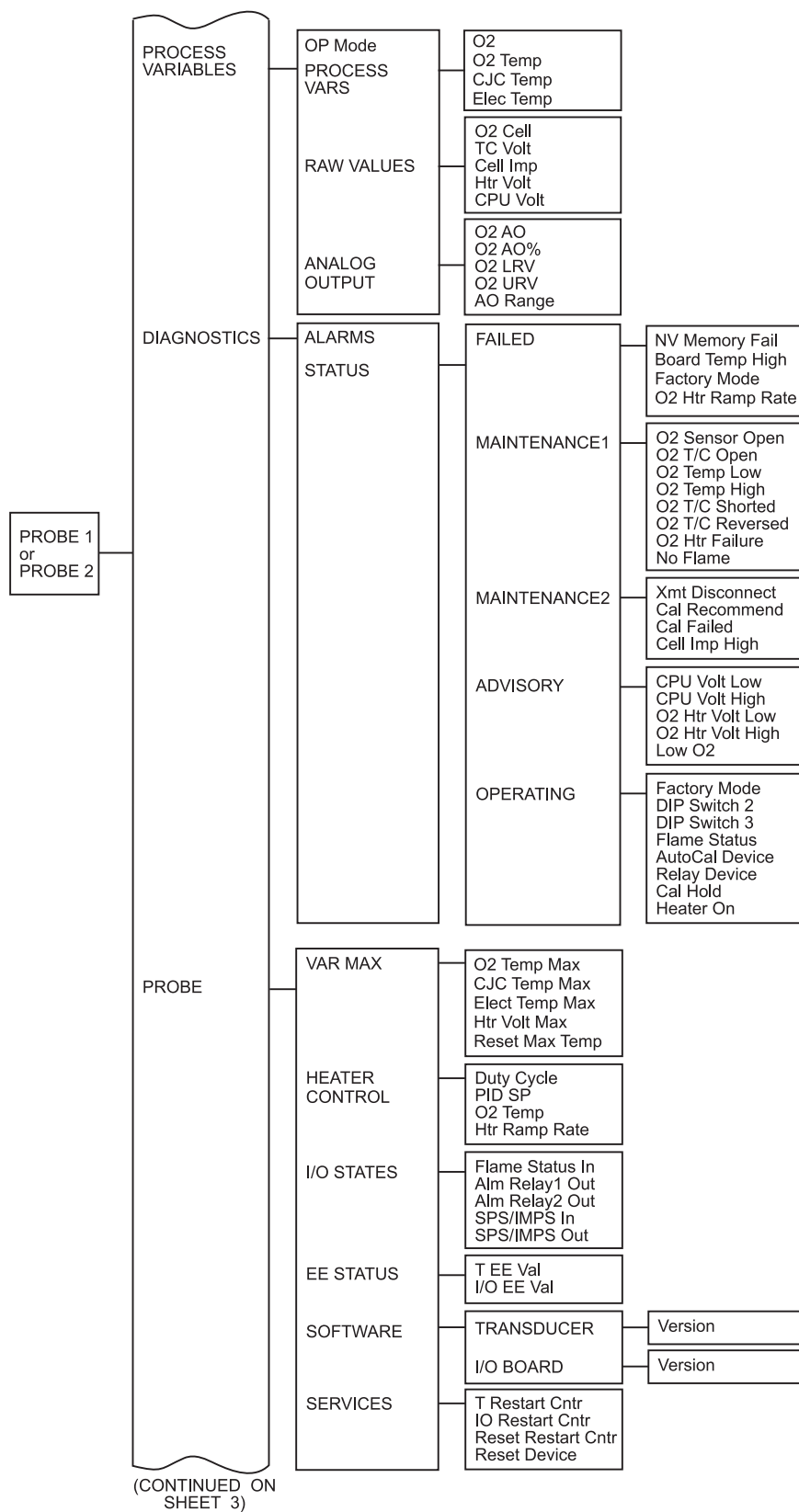
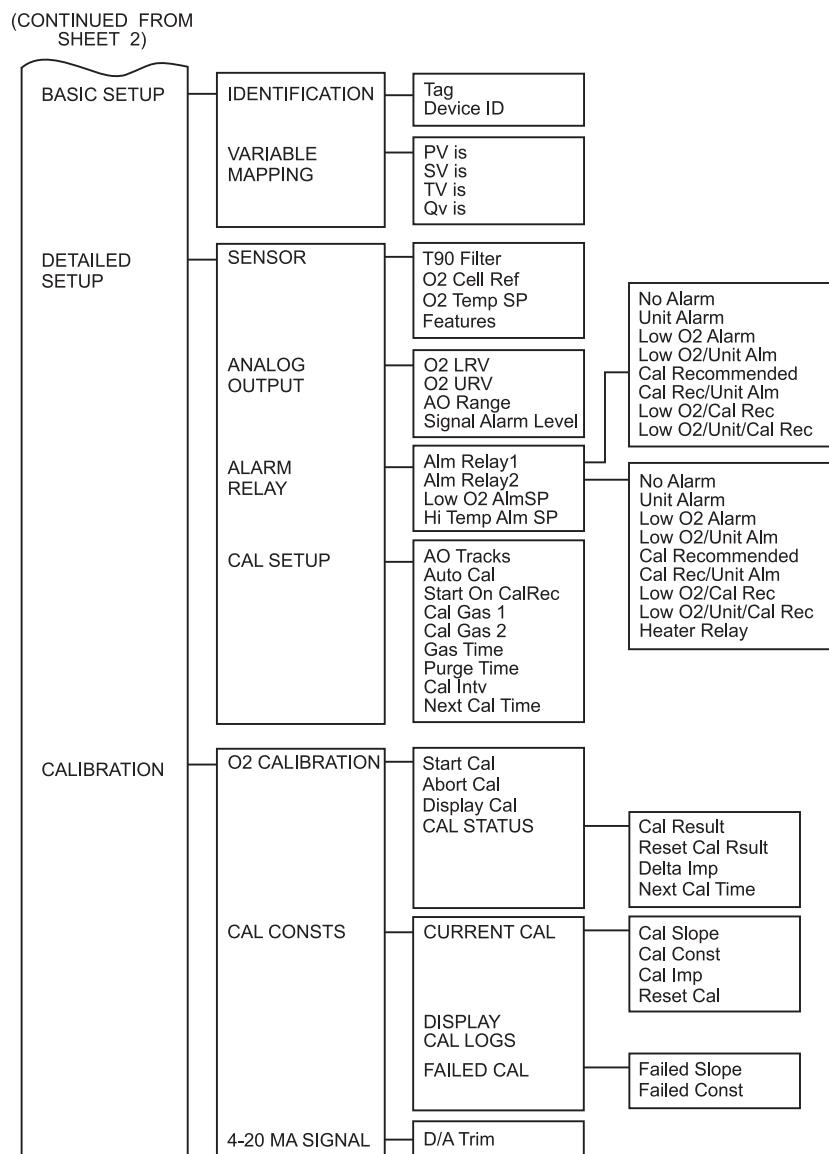


Figure 4-2. Xi Menu (Sheet 3 of 3)



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SYSTEM PARAMETER DESCRIPTIONS

Among the parameters available through the Xi and 375/475 Field Communicator menus are a number of "System Parameters". The system parameters define variables that configure the Xi in the transmitter system. System parameters are described in the following table.

CPU	PARAMETER NAME	UNITS	PARAMETER DESCRIPTION
Y	Version	--	Software version number for the CPU board.
Y	Build Num	--	Software build number for the CPU board.
Y	Comm Status	--	Communication status between the CPU and I/O boards.
Y	Restart Cntr	--	Software restarts counter for the CPU board.
N	Poll Addr	--	Polling Address - Address used to identify a Field Device; changeable by the user to control.
N	Serial Number	--	I/O board serial number.
N	Features	--	Available advanced software features for the I/O board. ON: feature supported. OFF: feature not supported.
N	EE Erase Count	--	This is for nonvolatile memory diagnostic only.
Y	Num Probe	--	Number of probes configuration: If set to 1, use One Probe configuration for the Main display. If set to 2, use Two Probes configuration for the Main display.
Y	Probe Sel	--	This parameter is applicable only if the Num Probe configuration is set to 2. It defines which probe is to be displayed.
Y	Probe 1 Enable	--	Probe 1 state. If enabled, the probe menu will be displayed otherwise it will not be displayed. (No, Yes)
Y	Probe 2 Enable	--	Probe 2 state. If enabled, the probe menu will be displayed otherwise it will not be displayed. (No, Yes)
Y	LineX Probe	--	Probe number for line x. (1, 2)
Y	Line 1 Data	--	Main display, line 1 data: 0 displays PV (O ₂), 1 displays SV (O ₂ Temp)
Y	Line 2 Data	--	Main display, line 1 data: 0 displays PV (O ₂), 1 displays SV (O ₂ Temp)
Y	Line 3 DataL	--	Main display, line 3 left hand side data: 0 displays PV (O ₂) 1 displays SV (O ₂ Temp) 2 displays TV (Cell Imp) 3 displays 4V (Cell mV) 4 displays CJC Temp 5 displays AO 6 displays OP Mode 7 displays Tag
Y	Line 3 DataR	--	Main display, line 3 right hand side data: 0 displays PV (O ₂) 1 displays SV (O ₂ Temp) 2 displays TV (Cell Imp) 3 displays 4V (Cell mV) 4 displays CJC Temp 5 displays AO 6 displays OP Mode 7 displays Tag
Y	Line 4 DataL	--	Main display, line 4 left hand side data: 0 displays PV (O ₂) 1 displays SV (O ₂ Temp) 2 displays TV (Cell Imp) 3 displays 4V (Cell mV) 4 displays CJC Temp 5 displays AO 6 displays OP Mode 7 displays Tag
Y	Line 4 DataR	--	Main display, line 4 right hand side data: 0 displays PV (O ₂) 1 displays SV (O ₂ Temp) 2 displays TV (Cell Imp) 3 displays 4V (Cell mV) 4 displays CJC Temp 5 displays AO 6 displays OP Mode 7 displays Tag
Y	Revert Time	min	Xi display reverts to main display time. Also locks screen if password protection is enabled.
Y	Language	--	0 displays English 1 displays Spanish 2 displays German
Y	Contrast	--	Display contrast: (120 to 200)
Y	Alarms	--	See section 5, Troubleshooting, "Alarm Indications".
Y	Password	--	Security Password
Y	Enable Password	--	Enables/disables security password protection

PROBE PARAMETER DESCRIPTIONS

Among the parameters available through the Xi and 375/475 Field Communicator menus are a number of "Probe Parameters". The probe parameters define variables that configure a specific probe in the transmitter system. Probe parameters are described in the following table.

TX	I/O	PARAMETER NAME	UNITS	PARAMETER DESCRIPTION
Y	Y	O2	%	Current oxygen concentration value (O2%). The value should reflect the last good O2 value if it is in the "Lock" state during calibration.
Y	Y	O2 Temp	degC	Current O2 sensor temperature.
Y	Y	CJC Temp	degC	Current cold junction temperature.
N	Y	Elec Temp	degC	Current electronic temperature measured at the I/O board.
Y	Y	O2 Cell	mV	Raw mV value for ZrO ₂ sensor.
N	Y	TC Volt	mV	O2 T/C voltage.
Y	Y	Cell Imp	Ohm	Cell impedance/sensor resistance measured.
Y	Y	Htr Volt	Volt	Heater voltage.
Y	Y	CPU Volt	Volt	Transmitter CPU voltage.
Y	Y	O2 AO	mA	Analog output value represents the O2 concentration measurement.
N	Y	O2 AO%	%	O2 analog output percentage for O2 AO.
Y	Y	O2 Temp Max	degC	This is the highest O2 sensor temperature reached since last reset.
Y	Y	CJC Temp Max	degC	This is the highest temperature reached at the cold junction since last reset.
N	Y	Elec Temp Max	degC	This is the highest temperature reached at the I/O board since last reset.
Y	Y	Htr Volt Max	degC	This is the highest heater voltage reached since last reset.
Y	Y	Htr Duty Cycle	--	O2 heater duty cycle. Value between 0 and 1.
Y	Y	PID SP	degC	PID temperature set point.
Y	Y	Htr Ramp Rate	degC/s	Heater ramp rate calculated in degree C per second.
N	Y	Flame Stat In	--	Flame status input state. (OFF/ON)
N	Y	SPS/IMPS In	--	SPS/IMPS input state. (OFF/ON)
N	Y	SPS/IMPS Out	--	SPS/IMPS output state. (OFF/ON)
N	Y	Alm Relay 1 Out	--	Alarm Relay 1 output state. (OFF/ON)
N	Y	Alm Relay 2 Out	--	Alarm Relay 2 output state. (OFF/ON)
Y	Y	OP Mode	--	Device operating mode: PO=Power up; WU=Warm Up (analog output is railed); NM=Normal operation; CA=Calibrating (analog output can be tracking or locked at last good value based on "AO Tracks" configuration); AL=Alarm detected (recoverable); SF=Alarm detected (non-recoverable)
Y	Y	Tag	--	Device tag.
Y	Y	Device ID	--	Unique Device ID number. (HART)
Y	Y	PV is	--	Primary variable assignment. (HART)
Y	Y	SY is	--	Secondary variable assignment. (HART)
Y	Y	TY is	--	Third variable assignment. (HART)
Y	Y	QV is	--	Fourth variable assignment. (HART)
Y	Y	Cal Slope	mV/Dec	Current calibration slope. This is the slope value that was calculated as a result of the last successful calibration.
Y	Y	Cal Const	mV	Current calibration constant. This is the constant value that was calculated as a result of the last successful calibration. It is valid between -4mV and +10mV.
Y	Y	Cal Imp	Ohm	Cell Impedance. This is the sensor resistance that was calculated as a result of the last successful calibration.
N	Y	Prev Slope	mV/Dec	Previous calibration slope. There are ten calibration results. 1 is the most recent and 10 is the least recent calibration slope.
N	Y	Prev Const	mV	Previous calibration constant. There are ten calibration results. 1 is the most recent and 10 is the least recent calibration constant.

Instruction Manual

IM-106-910Xi, Original Issue

November 2010

Xi Advanced Electronics

TX	I/O	PARAMETER NAME	UNITS	PARAMETER DESCRIPTION
N	Y	Prev Cal Imp	Ohm	Previous Cell Impedance. This is the sensor resistance that was calculated as a result of previous successful calibration. There are ten calibration results. Index 1 is the most recent and Index 10 is the least recent sensor resistance measured.
N	Y	Failed Slope	mV/Dec	Failed calibration slope.
N	Y	Failed Const	mV	Failed calibration constant.
Y	Y	Cal Result	mV	Calibration result.
N	Y	Delta Imp	--	Delta impedance since last calibration.
N	Y	Cal Step	--	This represents the step of the calibration cycle is in.
N	Y	Time Remain	sec	Time remaining in the present calibration cycle state.
Y	Y	O2 Slope	mV/Dec	O ₂ slope. This is the slope value that will be used to calculate O ₂ .
Y	Y	O2 Const	mV	O ₂ constant. This is the constant value that will be used to calculate O ₂ .
N	Y	T90 Filter	sec	Analog output T90 time. It represents the time to take a step change in oxygen to reach 90% of the final value at the filter output.
N	Y	O2 Cell Ref	%	O ₂ sensor reference gas percentage. It allows using a sensor reference gas other than air.
N	Y	O2 Temp SP	degC	O ₂ sensor temperature set point. It allows measurement of oxygen with an elevated sensor temperature. (0=736 degC set point; 1=834 degC set point)
N	Y	Features	--	Advanced software features. (0=Stoichiometer; 1=Programmable Reference; 2=Elevated Temperature)
Y	Y	O2 URV	%	Primary variable (O2%) upper range value.
Y	Y	O2 LRV	%	Primary variable (O2%) lower range value.
N	Y	O2 AO Range	--	Analog output polarity. (0=4-20 mA; 1=20-4 mA)
Y	Y	O2 Alarm Level	--	O2 alarm level. (0=3.5 mA; 1=21.1 mA)
N	Y	Alarm Relay 1	--	Alarm Relay 1 mode. (no alarm; unit alarm; low O2 alarm; low O2/unit alarm; Cal recommended; Cal recommended/unit alarm; low O2/Cal recommended; low O2/unit alarm/Cal recommended)
N	Y	Alarm Relay 2	--	Alarm Relay 2 mode. (no alarm; unit alarm; low O2 alarm; low O2/unit alarm Cal recommended; Cal recommended/unit alarm; low O2/Cal recommended; low O2/unit alarm/Cal recommended; Heater relay)
N	Y	Low O2 Alm	%	Low O2 alarm threshold.
N	Y	Hi Temp Alm	%	High temperature alarm threshold.
N	Y	AO Tracks	--	Analog output track O2 sensor measurement during a calibration. (No, Yes).
N	Y	Auto Cal	--	Enable/disable automatic calibration. No = Set to Manual calibration mode. Yes = Set to Automatic calibration mode.
N	Y	Start On CalRec	--	Start automatic calibration on Cal Recommended state. (No, Yes)
Y	Y	Cal Gas 1	%	Test Gas 1 value. This is the actual value of the gas being applied during the Test Gas 1 phase of a calibration.
Y	Y	Cal Gas 2	%	Test Gas 2 value. This is the actual value of the gas being applied during the Test Gas 2 phase of a calibration.
Y	Y	Gas Time	sec	Test Gas application time. This is the length of time test gases are applied to the O ₂ probe during low or high Test Gas phase of a calibration.
Y	Y	Purge Time	sec	Test Gas purge time. This is the length of time before the output will be returned to the process reading after a calibration.
N	Y	Cal Interval	hr	Automatic calibration interval. The number 9999 disables the automatic timed calibration.
N	Y	Next Cal Time	hr	Time remaining until the next automatic periodic calibration. The number 9999 disables the next automatic timed calibration.
Y	Y	T EE Val	--	Transmitter board nonvolatile memory diagnostic.
N	Y	IO EE Val	--	I/O board nonvolatile memory diagnostic.
Y	Y	Version	--	Software version number for the Transmitter.
N	Y	Version	--	Software version number for the I/O board.
Y	Y	T Restart Cntr	--	Software restarts count for the Transmitter.
N	Y	IO Restart Cntr	--	Software restarts count for the I/O board.
Y	Y	Alarms	--	Current Alarms (See section 5, Troubleshooting, "Alarm Indications".)

OPERATION VIA HART/AMS

The 375/475 Field Communicator is a handheld communications interface device. It provides a common communications link to all microprocessor-based instruments that are HART compatible. The handheld communicator contains a liquid crystal display (LCD) and 21 keys. A pocket-sized manual, included with the 375/475 Field Communicator, details the specific functions of all the keys.

The 375/475 Field Communicator accomplishes its task using a frequency shift keying (FSK) technique. With the use of FSK, high-frequency digital communication signals are superimposed on the Xi's 4-20 mA current loop. The 375/475 Field Communicator does not disturb the 4-20 mA signal, since no net energy is added to the loop.

NOTES

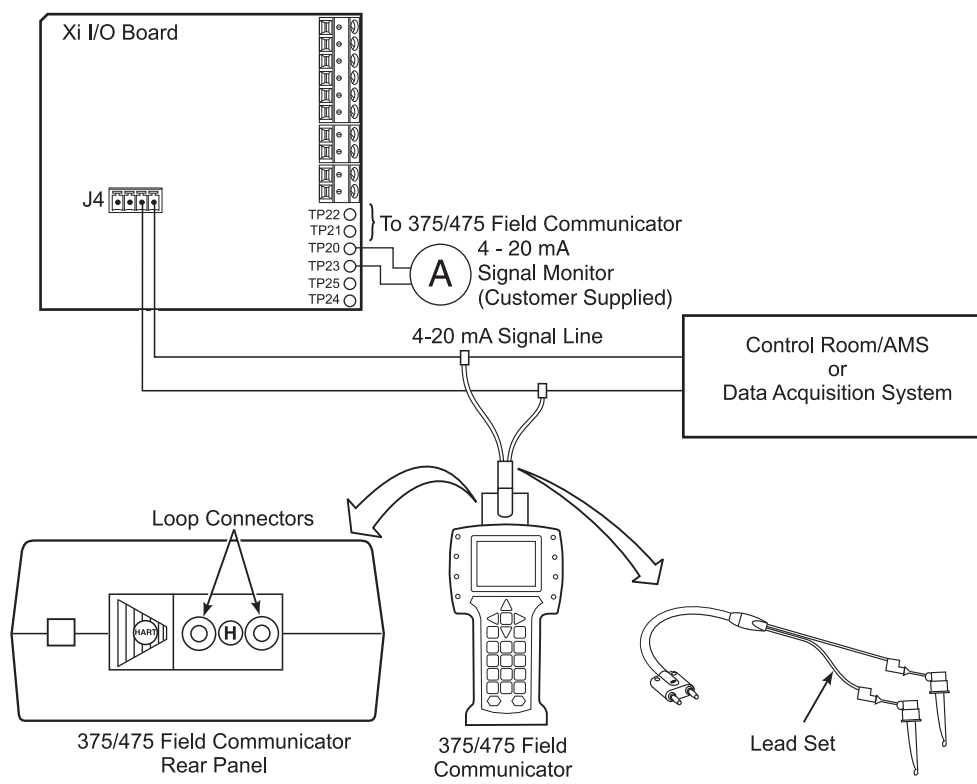
The 375 Field Communicator must be upgraded to System Software 2.0 with Graphic License for operation with the Xi. The AMS software must be upgraded to AMS 8.0 or above for operation with the Xi.

Contact Emerson Process Management's Global Service Center (GSC) at 1-800-833-8314 to upgrade the 375 Field Communicator software to System Software 2.0 with Graphic License.

Field Communicator Signal Line Connections

When working at the Xi, the 375/475 Field Communicator can be connected directly to test points TP21 and TP22 on the Xi I/O Board as shown in Figure 4-3. The AM+ and AM- test points are provided to monitor the 4-20 mA signal without breaking into the loop.

Figure 4-3. 375/475 Field Communicator Connection at the Xi



**Field Communicator
Menu Trees**

Connect the 375/475 Field Communicator in the Xi (Xi-to-DCS) 4-20 mA signal loop or to the Xi terminals as shown in Figure 4-3 and refer to Figure 4-4 for the 375/475 Field Communicator Xi menu tree.

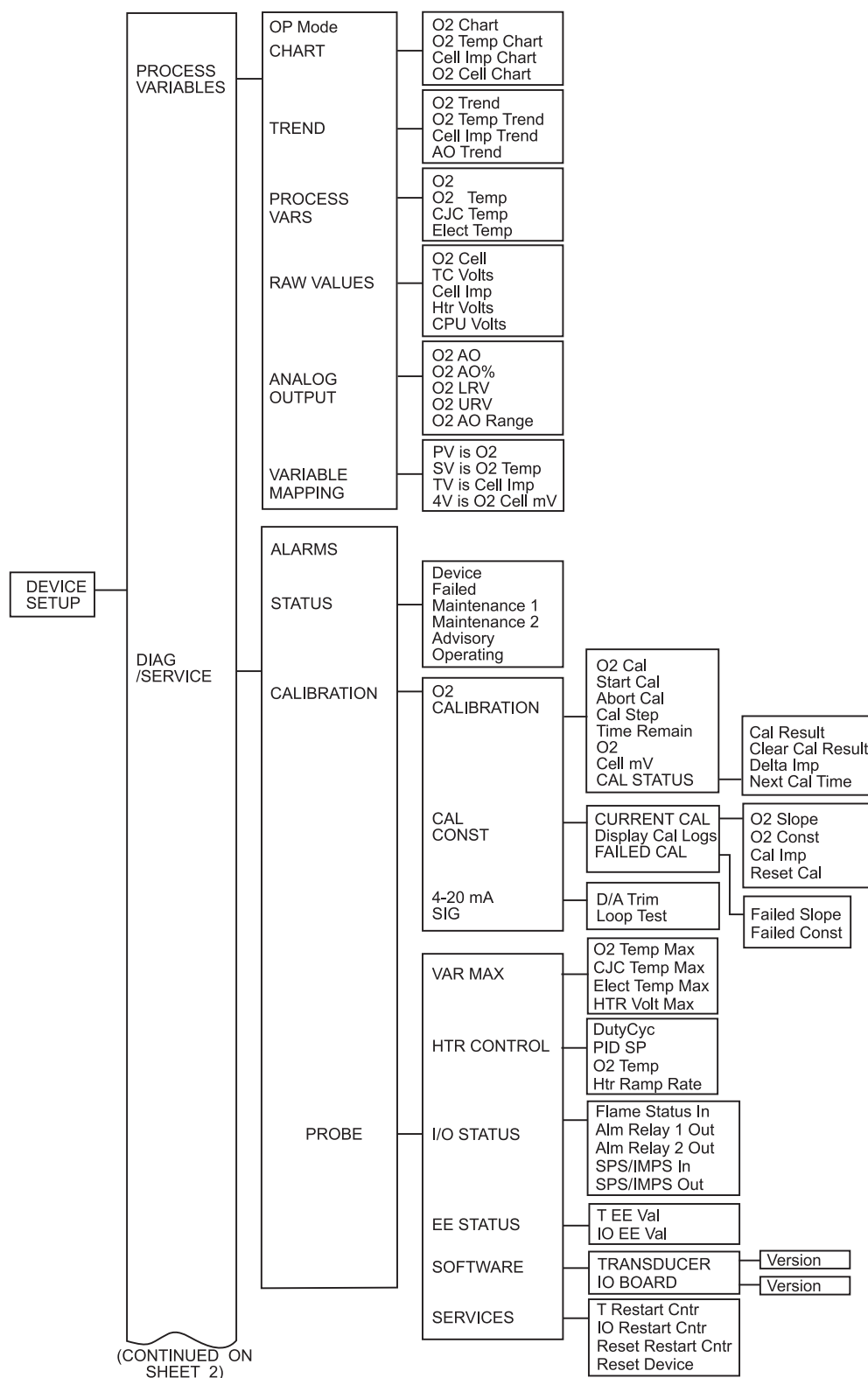
**OFF-LINE AND ON-LINE
OPERATIONS**

The 375/475 Field Communicator can be operated both off-line and on-line.

Off-line operations are those in which the communicator is not connected to the O₂ Probe. Off-line operations can include interfacing the 375/475 Field Communicator with a PC (refer to applicable HART documentation regarding HART/PC applications.)

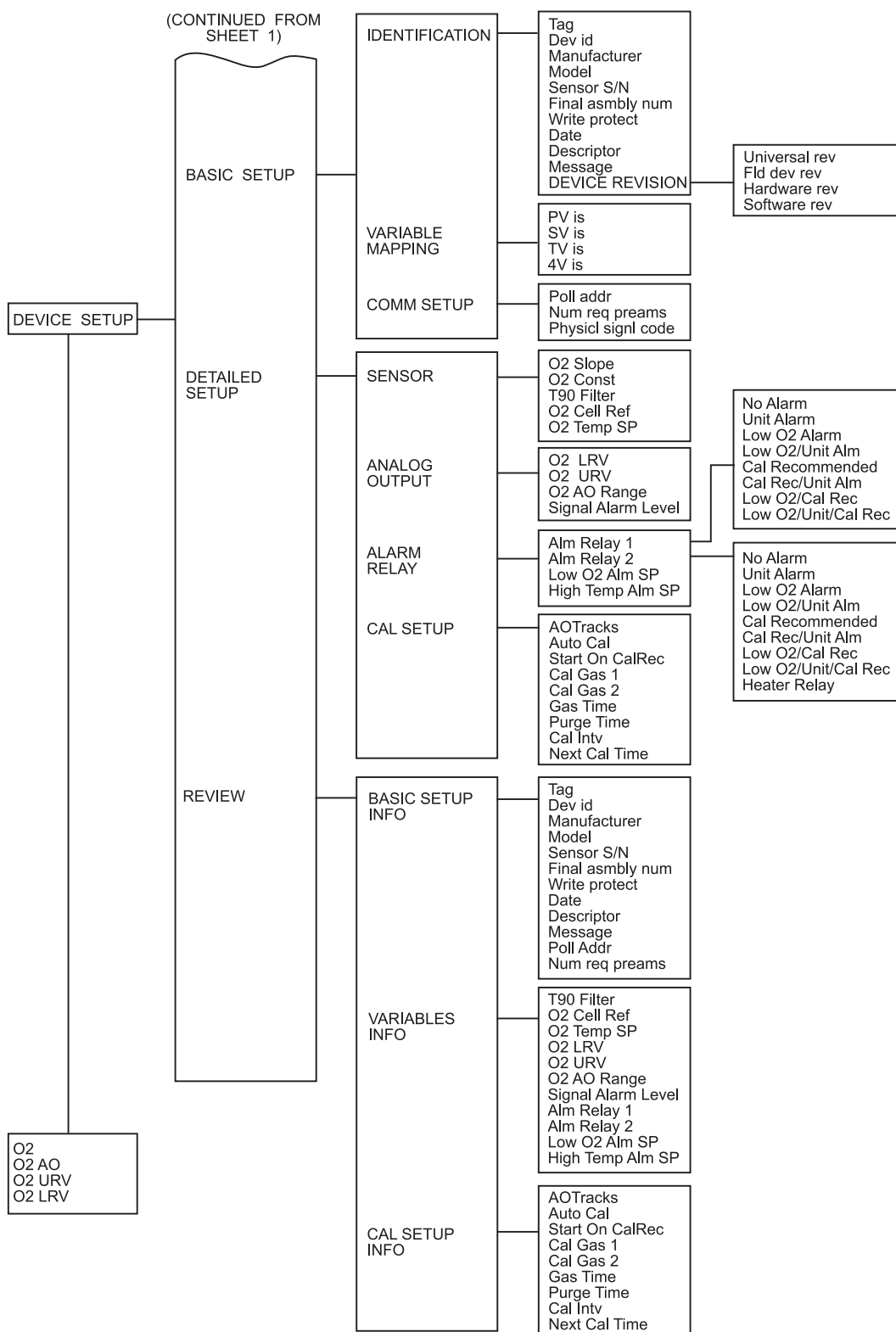
In the on-line mode, the 375/475 Field Communicator is connected to the 4-20 mA analog output signal line. The communicator is connected in parallel to the O₂ Probe or in parallel to the 250 ohm load resistor.

Figure 4-4. 375/475 Field Communicator Xi Menu Tree (Sheet 1 of 2)



38960020

Figure 4-4. 375/475 Field Communicator Xi Menu Tree (Sheet 2 of 2)



39640009

CALIBRATION - GENERAL

New O₂ cells may operate for more than a year without requiring calibration, but older cells may require recalibration every few weeks as they near the end of their life.

A CALIBRATION RECOMMENDED alarm provides notice of when a calibration is required. This strategy ensures that the O₂ reading is always accurate and eliminates many unnecessary calibrations based on calendar days or weeks since previous calibration.

The O₂ Probe(s) can be calibrated manually through the handheld 375/475 Field Communicator or the Xi. Fully automatic calibration can be performed automatically using the Xi and the SPS 4001B Single Probe Autocalibration Sequencer or the IMPS 4000 Intelligent Multiprobe Sequencer.

O₂ CALIBRATION

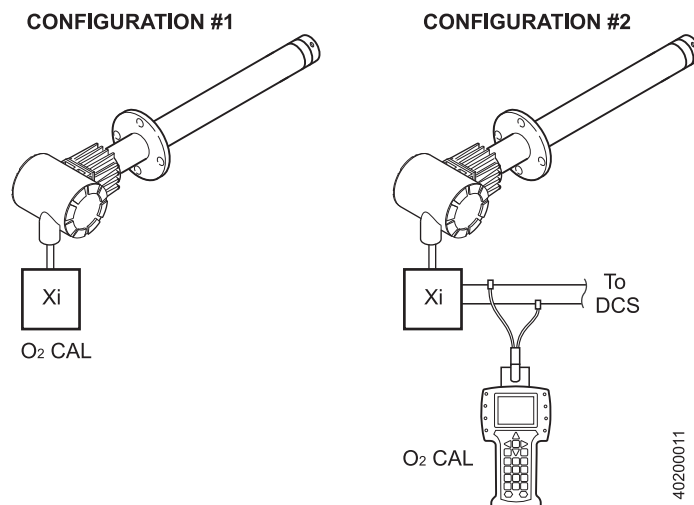
This section covers manual calibration. For automatic calibration details see the Instruction Manual for the SPS 4001B Single Probe Autocalibration Sequencer or the IMPS 4000 Intelligent Multiprobe Test Gas Sequencer.

Calibration can be performed using three basic calibration methods. The methods available to you for use depend on the configuration of your system. The paragraphs that follow describe how to perform a calibration for three basic system configurations shown in Figure 4-5.

Included in the calibration procedures are instructions for setting up the calibration parameters. Setup of the calibration parameters should be performed before the first O₂ calibration. Thereafter, perform calibration setup only as needed to change the calibration parameters or to reset the parameters following the replacement of primary system components.

Before calibrating verify that the configuration gas parameters are correct. Refer to Section 3: Configuration of Xi Electronics.

Figure 4-5. Calibration Methods, Simplified



O₂ Calibration with Xi

For systems with configuration 1, shown in Figure 4-5, use the following procedure to perform a calibration using the Xi. If necessary, use the Xi menu tree in Figure 4-2 for reference.

NOTE

To select a menu item, either use the up and down arrow keys to scroll to the menu item and press the right arrow key to select the menu item. To return to a preceding menu press the left arrow key.

1. From the Main Menu, select SYSTEM, to access the Xi System menu.
2. From the Xi SYSTEM menu, scroll down and select DETAILED SETUP.
3. Select menu item 4, CAL SETUP, to input the cal gas and flow times.
4. Return to the SYSTEM menu and select the last menu item, CALIBRATION, to access the CALIBRATION menu.
5. From the O₂ CALIBRATION options, select Start Cal to start the O₂ calibration procedure.

⚠ WARNING

Failure to remove the Xi from automatic control loops prior to performing this procedure may result in a dangerous operating condition.

6. In the first Start Cal screen, a "Loop should be removed from automatic control" warning appears. Remove the Xi from any automatic control loops to avoid a potentially dangerous operating condition and press OK.
7. Follow the Xi display prompts to perform the O₂ cal procedure.

**O₂ Calibration with Xi
and Field Communicator**

For systems with configuration 2, shown in Figure 4-5, use the following procedure to perform a calibration of the system using the 375/475 Field Communicator. If necessary use the menu tree in Figure 4-4 for reference.

NOTE

To select a menu item, either use the up and down arrow keys to scroll to the menu item and press the right arrow key or use the number keypad to select the menu item number. To return to a preceding menu, press the left arrow key.

1. Select DEVICE SETUP.
2. From the DEVICE SETUP screen select menu item 4, DETAILED SETUP.
3. Select menu item 3, CAL SETUP, to input the cal gas and gas flow times.
4. Return to the DEVICE SETUP screen and select menu item 2, DIAG/SERVICE.
5. From the DIAG/SERVICE screen, select menu item 3, CALIBRATION, to access the O₂ CALIBRATION screen.
6. From the O₂ CALIBRATION screen, select menu item 1, O₂ CAL, to access the O₂ calibration procedure.

⚠ WARNING

Failure to remove the Xi from automatic control loops prior to performing this procedure may result in a dangerous operating condition.

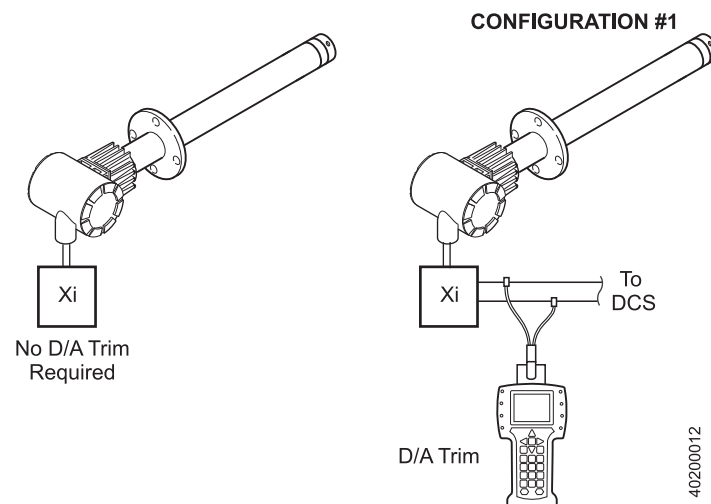
7. In the first O₂ CAL screen, a "Loop should be removed from automatic control" warning appears. Remove the Xi from any automatic control loop to avoid a potentially dangerous operating condition and press OK.
8. Follow the handheld 375/475 Field Communicator display prompts to perform the O₂ cal procedure.

D/A TRIM

The D/A trim procedure is used to calibrate the 4-20 mA output signal to a precision mA measurement device.

The two paragraphs that follow describe how to perform a D/A trim for two of the three basic system configurations shown in Figure 4-10. Only the signal to the DCS needs to be trimmed.

Figure 4-6. D/A Trim Methods, Simplified



D/A Trim with Xi

For systems with configuration 1, shown in Figure 4-6, use the handheld 375/475 Field Communicator to access the D/A trim procedure according to the instructions that follow. Refer to the 375/475 Field Communicator Xi Menu Tree in Figure 4-2.

1. From the DEVICE SETUP screen select menu item 2, DIAG/SERVICE, to access the diagnostics and service menu options.
2. Select menu item 3, CALIBRATION, to access the calibration menu options.
3. Select menu item 3, 4-20 mA SIG, to access the 4-20 mA SIGNAL screen.
4. Select menu item 1, D/A Trim, to start the trim procedure.

Section 5 Troubleshooting

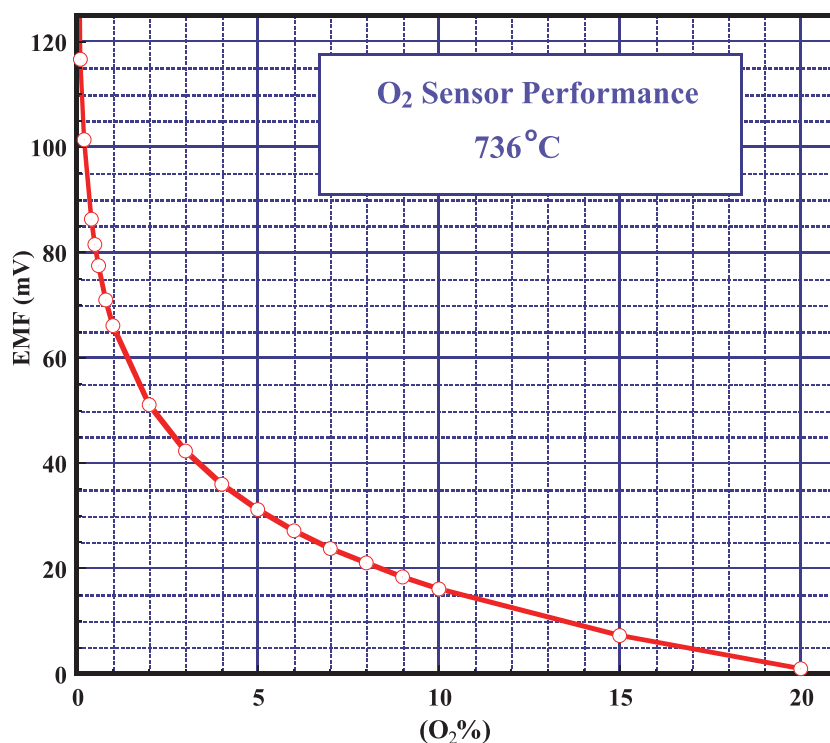
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OVERVIEW OF OPERATING PRINCIPLES

When the Zirconium Oxide sensing cell is heated to its setpoint [736°C (1357°F)], the cell will generate a voltage that represents the difference between the process O₂% and the reference O₂% inside the probe (20.95% O₂ instrument air).

When flowing calibration gases, the raw cell millivolt value should represent the levels on the chart in Figure 5-1. Note that the raw cell millivolt value increases logarithmically as the O₂ concentration decreases.

Figure 5-1. O₂ Sensor mV Reading vs %O₂ at 736°C (1357°F) (Reference Air, 20.95% O₂)



38960049

O ₂ %	100	20	15	10	9	8	7	6	5	4
EMF (mV)	-34	1.0	7.25	16.1	18.4	21.1	23.8	27.2	31.2	36.0
O ₂ %	3	2	1	0.8	0.6	0.5	0.4	0.2	0.1	0.01
EMF (mV)	42.3	51.1	66.1	71.0	77.5	81.5	86.3	101.4	116.6	166.8

GENERAL

⚠ WARNING

Install all protective equipment covers and safety ground leads after troubleshooting. Failure to install covers and ground leads could result in serious injury or death.

Consider the following equipment conditions, features, and requirements when troubleshooting a problem.

Grounding

It is essential that adequate grounding precautions are taken when installing the system. Thoroughly check both the probe and electronics to ensure the grounding quality has not degraded during fault finding. The system provides facilities for 100% effective grounding and the total elimination of ground loops.

Electrical Noise

The Xi has been designed to operate in the type of environment normally found in a boiler room or control room. Noise suppression circuits are employed on all field terminations and main inputs. When fault finding, evaluate the electrical noise being generated in the immediate circuitry of a faulty system. Ensure all cable shields are connected to earth.

Electrostatic Discharge

Electrostatic discharge can damage the ICs used in the electronics. Before removing or handling the circuit boards, ensure you are at ground potential.

ALARM INDICATIONS

The first indication of a problem at the O₂ measuring system usually comes from the operators running the process. Critical alarms that render the O₂ measurement unusable will force the 4-20 mA analog output signal representing O₂ to go to a default condition, as follows:

4-20 mA Signal Alarm Level	Transmitter Condition
0 mA	Transmitter unpowered, or completely failed
3.5 mA	Critical Alarm - transmitter reading unusable (factory default)
3.8 mA	Reading Under Range (Example - user sets range to 2-10%. Current reading is 1.9%)
4 to 20 mA	Normal Operation
20.5 mA	Reading Over Range (Example - range is 0-10%. Current reading is 12%)
>21 mA	Critical Alarm - transmitter reading is unusable (user can choose this alarm level instead of the factory default level of 3.5 to 3.6 mA)

NOTE

To ensure correct operation you should make sure that the Digital Control System is configured to interpret these signal levels correctly.

Once an alarm condition is identified, the Xi offers a number of diagnostics to interpret the specific alarm.

Alarm indications are available via the Xi or the 375/475 Field Communicator and Rosemount Analytical's Asset Management software. When the error is corrected and/or power is cycled, the diagnostic alarms will clear or the next error on the priority list will appear.

IDENTIFYING AND CORRECTING FAULT INDICATIONS

There are two types of alarms; recoverable and non recoverable. If an existing alarm is recoverable, the alarm-active indication will disappear when the alarm condition no longer exists. If an alarm is not recoverable, the alarm indication will continue to be displayed after the cause of the alarm condition is corrected. AC power to the Xi must be cycled to clear a non-recoverable alarm.

Alarm messages are displayed on the Xi display window when the alarm status display is accessed via the Xi menu. A listing of the alarm/fault messages and the related fault status descriptions are shown in Table 5-1.

Fault conditions that give no fault indication and that allow the probe to pass calibration are listed and discussed after Table 5-1.

Table 5-1. Diagnostic/Unit Alarm Fault Definitions

Message	Status	Self Clearing
NV Mem Fail	A checksum error was detected in the nonvolatile memory configuration data when the unit was turned on.	No
Factory Mode	On Xi box I/O board, SW4, position 1 is set on "ON". On transmitter electronics board, SW1, position 1 is set to "ON". This setting should only be used in the factory.	No
Board Temp Hi	The transmitter electronic board temperature reading is above 126°C or the Xi unit I/O board temperature reading is above 86°C.	No
O2 Htr Ramp Rate	The O ₂ sensor heater ramp rate is greater than max allowed ramp rate indicating a run away heater condition.	No
O2 Sensor Open	The cell impedance voltage is reading less than -1.1 VDC indicating the O ₂ sensor wires may be disconnected or the O ₂ sensor junction may be open.	Yes
O2 TC Open	The O ₂ cell heater thermocouple voltage is reading more than the hardware configured threshold voltage. This indicates the thermocouple wires may be disconnected or the thermocouple junction may be open.	Yes
O2 Temp Low	The heater temperature is below the minimum temperature. The predefined low temperature threshold is the 726°C.	Yes
O2 Temp High	The heater temperature is above the defined temperature threshold. The high temperature threshold is the defined by the "High Temp Alm SP" parameter. The default value is 750°C.	Yes
O2 T/C Shorted	The O ₂ sensor heater temperature thermocouple voltage is shorted.	Yes
O2 T/C Reversed	The O ₂ sensor heater temperature thermocouple voltage is reading a negative voltage indicating the thermocouple wire connections may be reversed.	Yes
O2 Htr Failure	The O ₂ sensor heater temperature is not responding to the controller and can't reach final temperature set by the device, indicating the O ₂ heater may have failed.	Yes
No Flame	The Flame Status Relay Input is set to the OFF state indicating it is not safe to operate the O ₂ heater and the heater should be turned off.	Yes
Xmtr Disconnect	Communication failures detected between transmitter and the I/O board indicating the transmitter has been disconnected from the I/O board.	Yes
Cal Recommended	Probe calibration is recommended. The cell impedance is above 100 ohms and has shifted 50 ohms since the last calibration; the accuracy of the O ₂ reading may be compromised.	Yes
Cal Failed	A calibration error occurred during the last calibration. The measured slope or constant is outside the acceptable range. (Slope: 34.5 to 57.5 mv/decade) (Constant: ±20 mv)	Yes
Cell Imp High	The O ₂ sensor impedance/cell resistance value measurement is greater than 2000 Ohms indicates the cell may be beyond its useful life.	Yes
CPU Voltage Low	The CPU voltage is less than 2.7 V indicating the CPU voltage is too low.	Yes
CPU Voltage High	The CPU voltage is more than 3.3 V indicating the CPU voltage is too high.	Yes
Htr Voltage Low	The heater voltage for the O ₂ cell heater is below 35 volts.	Yes
Htr Voltage High	The heater voltage for the O ₂ cell heater is above 264 volts.	Yes
Low O2	The O ₂ reading is below the "Low O2 Alm SP".	Yes

CALIBRATION PASSES, BUT STILL READS INCORRECTLY

There are a few fault conditions where no alarm indication is present and the probe passes calibration, but the O₂ reading may still be incorrect:

An incorrect flow rate of calibration gases can cause a shifted calibration. If the flow rate of calibration gases is too low, process gases can mix in with the calibration gases causing a mixture at the cell that is different than what is noted on the calibration gas bottles. Always set the calibration flow rate when a new diffuser is installed, and never readjust this flow rate until another new diffuser is installed. For applications with heavy particulate loading, see "Probe Passes Calibration, But O₂ Still Appears To Read Low".

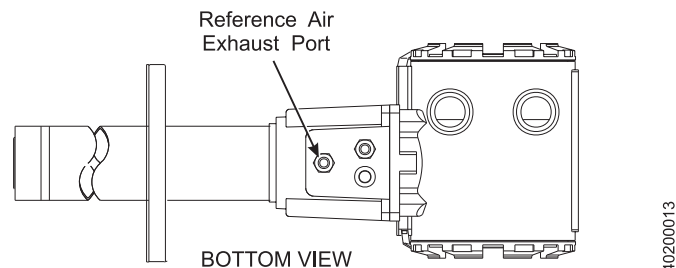
No or improper reference air supplied.

Probe Passes Calibration, O₂ Still Reads High

External Reference Air Leak - There may be a leak that is permitting ambient air to mix with the process gases. Since many combustion processes are slightly negative in pressure, ambient air can be drawn into the cell area, biasing the O₂ reading upward.

1. Make sure that the calibration gas line is capped tightly between calibrations.
2. If autocal is used, make sure the check valve is seating properly.

Figure 5-2. Probe Leakage Paths



Internal Reference Air Leak - See Figure 5-2. There may be a leak inside the O₂ Probe itself, permitting the reference air (20.95% O₂) to mix with the process gases at the cell. To confirm this leak condition, pressurize the inside (reference side) of the probe by plugging the reference air exhaust port with your finger for 1 minute. (The conduit ports where the signal and power wires pass may also need to be sealed.) The O₂ reading should decrease slightly. If the O₂ reading increases during this test there is a leak inside the probe.

1. Acid condensation inside the probe can degrade the hose that carries the cal gas to the cell. Inspect this hose. Dislodging or improper installation of the cal gas or reference air hose can cause a leakage path.
2. The sensing cell is fastened to the end of the probe tube and uses a corrugated washer to separate the process gases from the ambient reference air. The corrugated washer may be damaged by corrosion. Discard used washer.

NOTE

You should always install a new corrugated washer whenever you remove the sensing cell from the probe.

Bad Reference Side Cell Electrode - A bad reference side cell electrode can cause an elevated O₂ reading. This fault is usually indicated by a frequent "Calibration Recommended" alarm and increasing cell impedance readings. A high cell impedance can be calibrated out, but if the impedance continues to increase rapidly, the sensing cell must be replaced.

Probe Passes Calibration, O₂ Still Reads Low

The diffusion element at the end of the probe is a passive filter. It plugs very slowly, since there is no active flow being drawn across it. In applications that have a heavy particulate loading (coal or wood fired boilers, cement and lime kilns, catalyst regeneration, recovery boilers, etc.), this diffusion element will eventually plug.

NOTE

It is important not to pressurize the sensing cell during calibrations by flowing excessive cal gas against a plugged diffuser. Always use a two-stage regulator for setting calibration gas pressure. Calibration flow rates should be set only when a new diffuser is installed. As the diffuser plugs, do not adjust the flow rates upward.

How do I detect a plugged diffuser?

The O₂ cell's speed of response will degrade. The O₂ trend in the control room will become smoother.

When calibrating, the calibration gas flow rate will be noted to be lower. Never readjust this flow upwards to correct for a plugged diffuser. Adjust this flow only when a new diffuser is installed.

Always note the time it takes for the cell to recover to the normal process value after the cal gas is removed. As the diffuser plugs, this recovery time will get longer and longer. Use the Calibration Record provided to record and track Calibration Response times.

Can I calibrate a badly plugged diffuser?

It may not be possible to immediately replace a plugged diffuser while the process is on line.

One can calibrate the probe without pressurizing the cell by adjusting the calibration gas flow rate downward before calibration. For instance, say the process is at 3%, and the first calibration gas is 8%. Adjust the flow of cal gas downward until the reading begins to migrate from 8% to lower values, indicating that process gases are now mixing in with the calibration gases.

Adjust the flow rate back up until this mixing is just eliminated. Calibrate at this flow rate. Replace the diffuser at the first opportunity.

⚠ WARNING

Install all protective equipment covers and safety ground leads after troubleshooting. Failure to install covers and ground leads could result in serious injury or death.

Calibration Record For Rosemount Analytical In Situ O₂ Probe

Probe Serial Number: _____

Probe Tag Number: _____

Probe Location: _____

Date Placed Into Service: _____

[illegible]

Notes: Response_{initial} When the second calibration gas is turned off, note the number of seconds required for the O₂ value to begin migrating back to the process value.

Response_{final} When the second calibration gas is turned off, note the number of seconds required for the O₂ value to settle out at the process value.

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OVERVIEW

This section identifies the calibration methods available and provides the procedures to maintain and service the Xi.

WARNING

Install all protective equipment covers and safety ground leads after equipment repair or service. Failure to install covers and ground leads could result in serious injury or death.

MAINTENANCE INTERVALS

The maintenance interval required is quite variable, depending on the type of service the analyzer is placed into. The zirconium oxide sensing cell is non-depleting, and has no specific shelf life or a defined life in flue gas operation. The cell of a probe that is mounted inside a boiler that is burning natural gas may shift very little over several years. Acidic compounds are the main aggressors to the sensing cell, typically SO₂ resulting from sulfur contained in coal and heavy oil fuels, and also HCl from the combustion of plastics in municipal incinerators and in industrial thermal oxidizers. Sensing cells may experience significant degradation and signal shift in this type of service, particularly if the operating levels of O₂ are very low (below 1% O₂).

A calibration check is generally recommended on a quarterly basis (every 3 months) by flowing bottled gas to the probe. (Make sure that the operations personnel are notified when doing this, and also make sure that the O₂ control loop is placed in manual mode). If the probe readings vary significantly from the bottle values, then a formal calibration should be conducted as noted in Section 4: Startup and Operation.

The Xi offers a "calibration recommended" diagnostic that will indicate when the probe needs to be calibrated.

Combustion processes that have a high level of ash or other particulate content will cause the diffusion element on the end of the probe to plug off. A badly plugged diffuser will cause a slower speed of response to changing O₂ levels in the process. This can usually be seen on the recorded trends in the control room.

When performing a calibration check or actual calibration, the calibration flow meter may read lower if the diffuser is badly plugged. (Never increase the flow rate back up, however, as this can cause a shifted calibration. Adjust the calibration flow rate only when a new diffuser is installed). Always record the response time back to the process after the calibration gases are removed, as noted on the calibration record at the end of this section. Diffuser pluggage can be tracked through this record.

A visual inspection of the probe should be conducted during plant outages, paying particular attention to condensed components. Condensation can be reduced or eliminated by insulating the probe installation, including the probe mount, flange, and dual blue housings.

CALIBRATION

The Xi can calibrate an O₂ Probe manually through the front panel display or via a handheld 375/475 Field Communicator, or automatically through the SPS 4001B Single Probe Autocalibration Sequencer or the IMPS 4000 Intelligent Multiprobe Test Gas Sequencer.

Automatic Calibration

The Xi can be used with the SPS 4001B or IMPS 4000 in order to perform an auto / semi-auto calibration. Refer to the SPS 4001B or IMPS 4000 Instruction Manual for further details on how to configure and perform an automatic calibration.

Manual Calibration

Refer to the "Calibration - General" in Section 4: Startup and Operation to perform a manual calibration.

REPLACEMENT PARTS

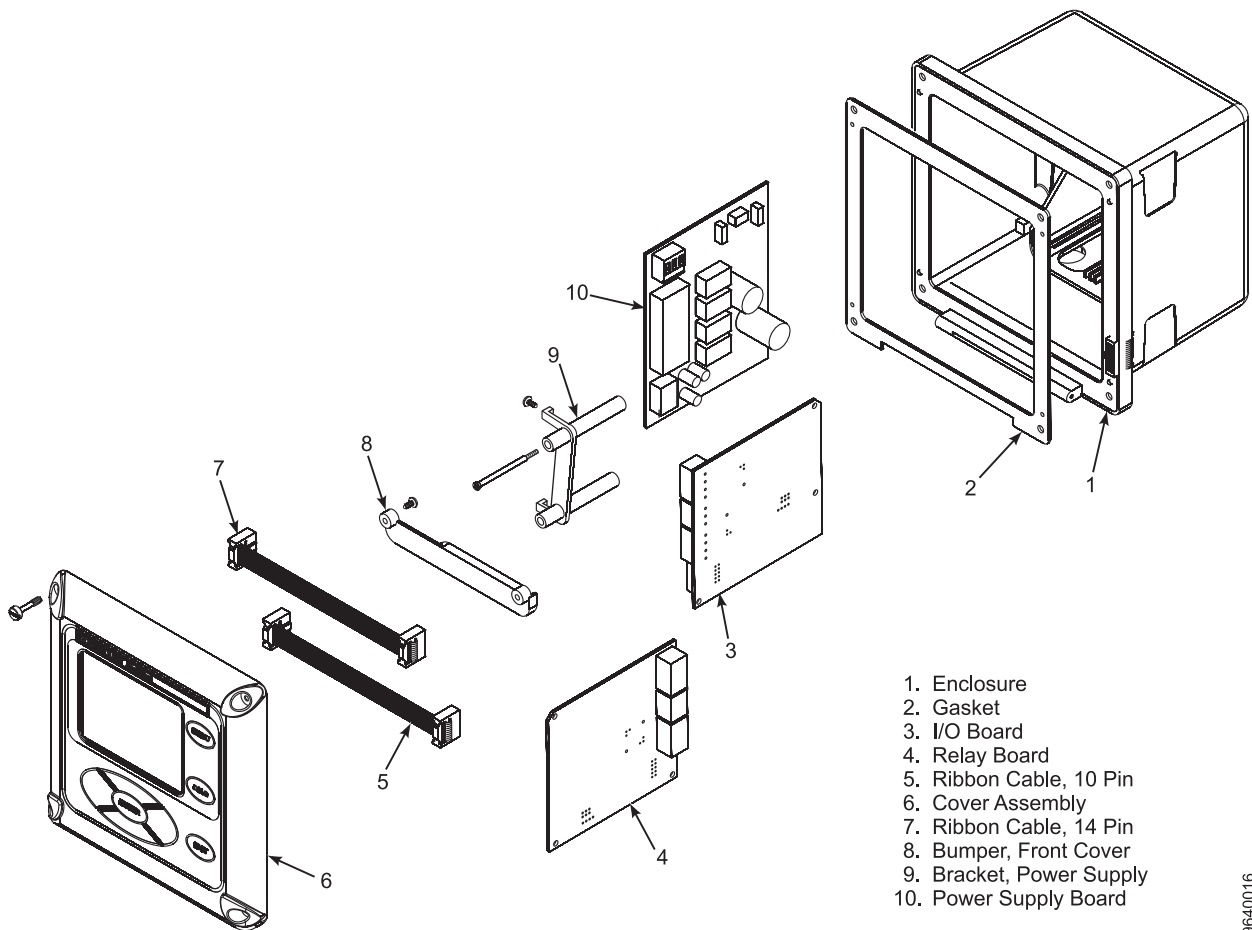
Refer to Section 7: Replacement Parts for individual replacement parts and part replacement kits. Part replacement kits are available for each of the components discussed in this section.

Xi COMPONENTS REPLACEMENT

Each of the following procedures details how to replace a specific component of the Xi. Most of these procedures include component setup instructions that must be performed before returning the related O₂ Probe to service. Refer to Figure 6-1 and Figure 6-2 for illustrations of the Xi components.

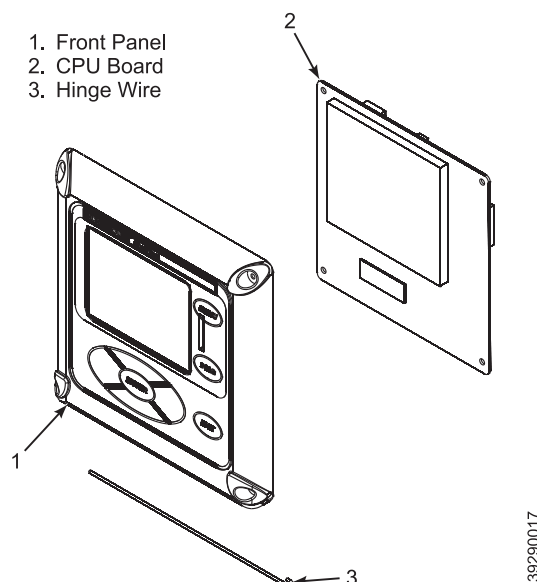
Component replacement kits are available for each of the components replaced in this repair section. Refer to Section 7: Replacement Parts for kit part numbers.

Figure 6-1. Xi Components



39640016

Figure 6-2. Xi Front Panel
Components



I/O Board Replacement

Use the procedure that follows to replace and set up the I/O board in the Xi.

⚠ WARNING

Disconnect and lock out power before working on any electrical components.

⚠ CAUTION

The I/O Board is shipped from the factory without any of the enhanced software features activated. These features must be activated once the new board has been installed and before the Remote Interface is put into service.

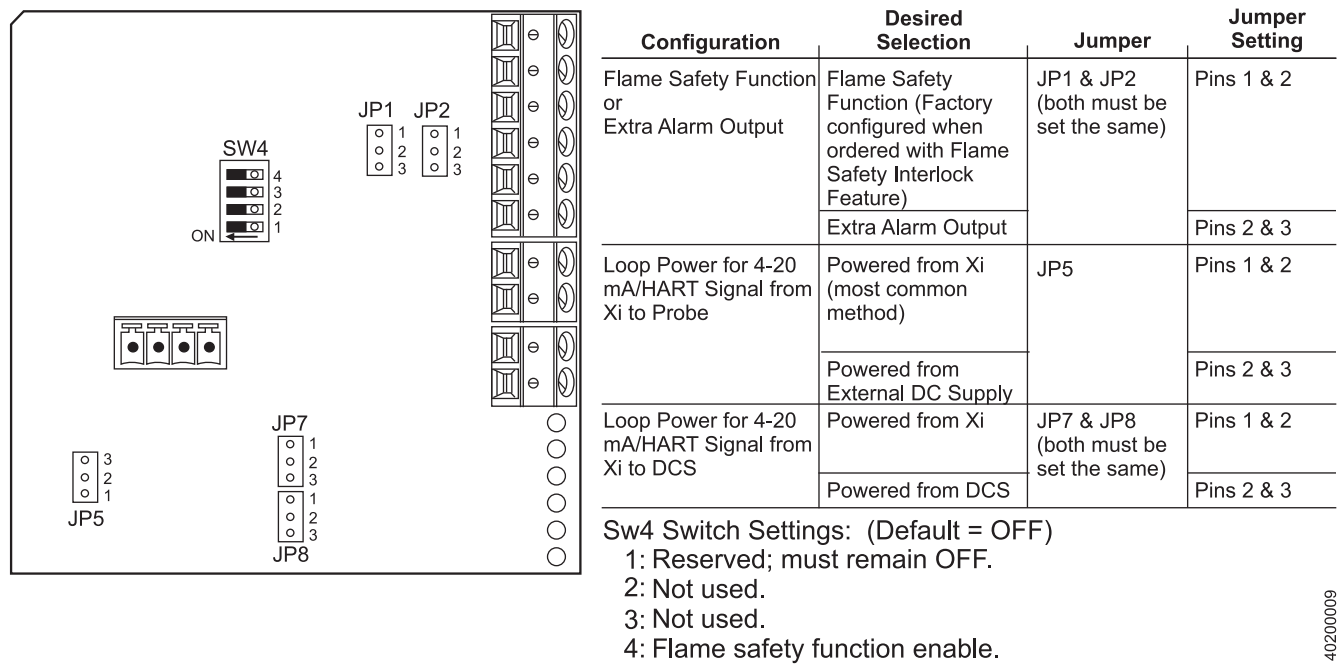
⚠ CAUTION

If the existing I/O Board has been operated with the Stoichiometric enhanced software feature, this feature must be activated in the new board before the Xi Electronics is put back into service. Failure to do so will cause a false analog output signal to the DCS.

Replacing an Existing I/O Board

1. Loosen the four screws securing the Xi cover. The screws are captive and do not need to be completely removed.
2. Swing the Xi cover down to expose the inner components.
3. Disconnect the 10-pin ribbon cable from the I/O Board. A new cable is supplied in the replacement kit and should be used if the old one is damaged.
4. Tag and disconnect wiring for Alarm Outputs, Flame Status Input and/or SPS/IMPS as applicable.
5. Slide the I/O Board part way out of the Xi enclosure.
6. Disconnect the 4-position plug for the transmitter probe and output wiring. Remove the I/O Board completely from the Xi enclosure.
7. See Figure 6-3. Set jumpers JP1, JP2, JP5, JP7 and JP8 to their proper positions using the old I/O Board as a guide.
8. Set switch SW4 to their proper positions using the old I/O Board as a guide.
9. Partially slide the new I/O Board into the Xi enclosure. Ensure the board is correctly aligned within the slots in the enclosure.
10. Connect the 4-position plug for the transmitter probe and output wiring. Slide the I/O Board completely into the Xi enclosure.

Figure 6-3. I/O Board Jumper & Switch Settings



40200009

11. Reinstall wiring for Alarm Outputs, Flame Status Input and/or SPS/IMPS as applicable. See Figure 6-4 and Figure 6-5 for wiring diagrams. See Figure 6-6 for I/O board positions in the Xi enclosure.
12. Connect the ribbon cable to the I/O Board. A new cable is supplied and should be used if the old one is damaged.
13. Swing the Xi cover up in place and tighten the four screws.
14. Prior to operating the O₂ Probe and the Xi, all optional software enhancements (previously enabled or not) must be enabled. Notify Rosemount Analytical Inc. and reference the following part numbers to enable the related software options:

Part Number	Software Option
6A00269G01	Enhanced Software Option Upgrade, Stoichiometric Function
6A00269G02	Enhanced Software Option Upgrade, Programmable Reference Function
6A00269G03	Enhanced Software Option Upgrade, 850°C Process Function

NOTE

For enhanced software upgrades or to enable optional software features previously used in your Xi configuration, contact Rosemount Analytical Inc. at 1-800-433-6076.

15. Recalibrate the O₂ Probe according to the applicable calibration instructions in Section 4: Startup and Operation.

Figure 6-4. I/O Board Wiring Connections

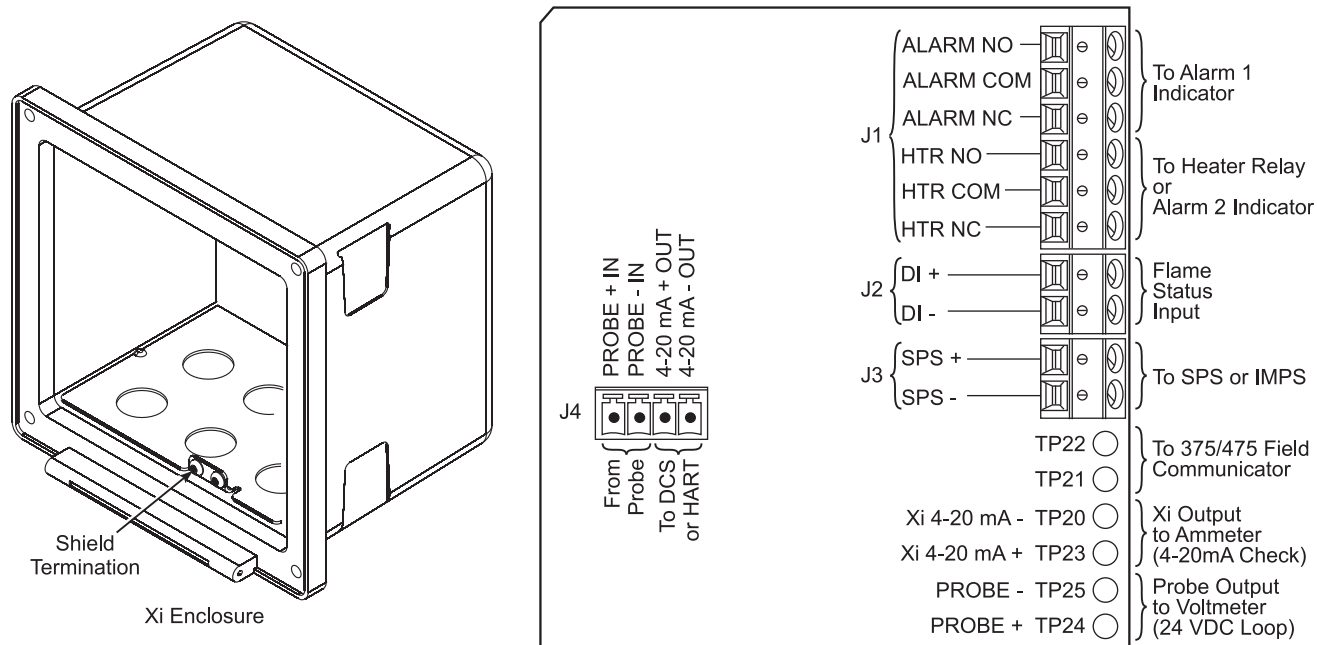


Figure 6-5. I/O Board Flame Safety Interlock Wiring

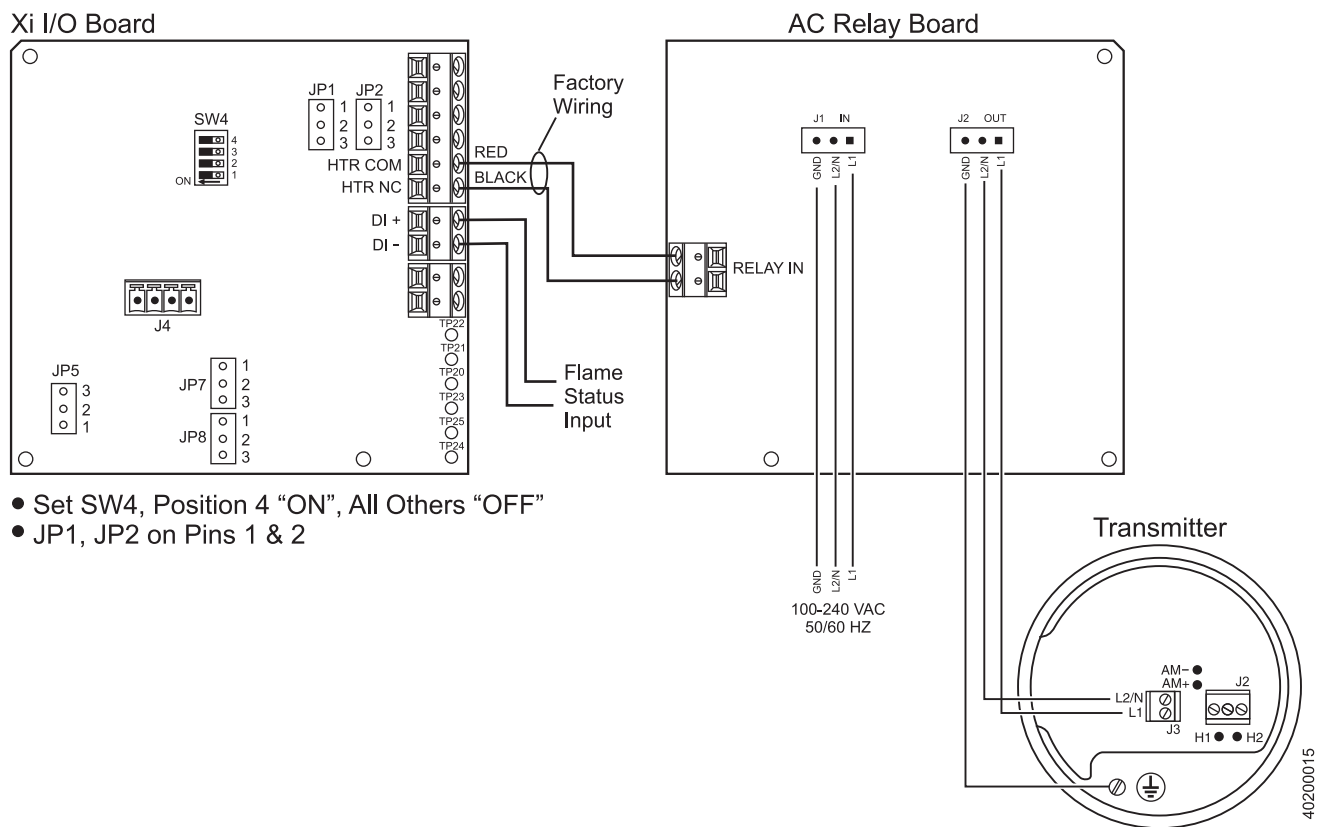
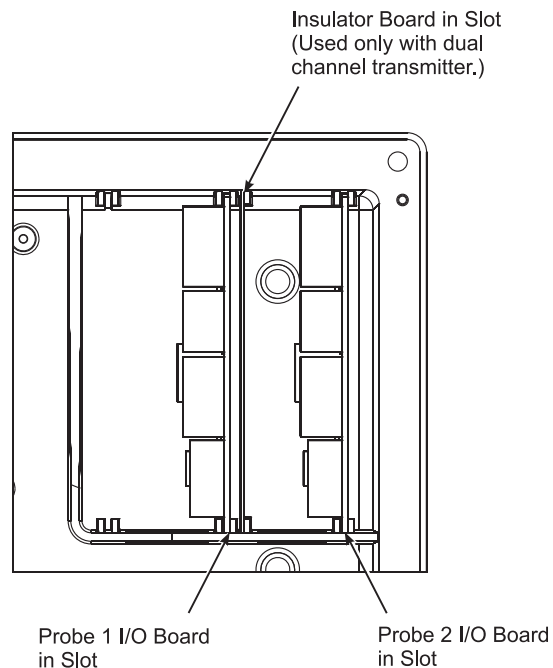


Figure 6-6. I/O Board Positions in the Xi Enclosure



39410035

AC Relay Board Replacement

Use the procedure that follows to replace and set up the AC Relay board in the Xi.

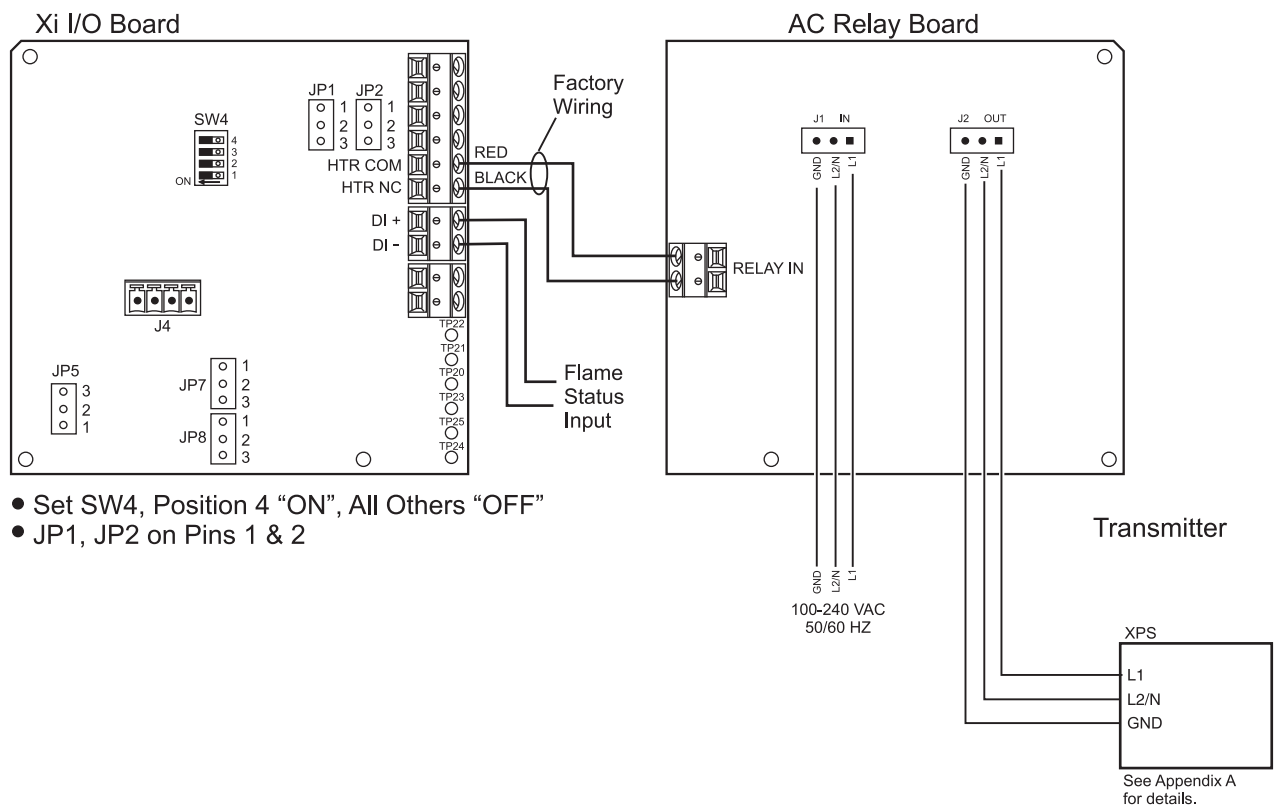
⚠ WARNING

Disconnect and lock out power before working on any electrical components.

Replacing an Existing AC Relay Board

1. Loosen the four screws securing the Xi cover. The screws are captive and do not need to be completely removed.
2. Swing the Xi cover down to expose the inner components.
3. Tag and disconnect wiring for the Relay In.
4. Slide the AC Relay Board part way out of the Xi enclosure.
5. Tag and disconnect the two 3-position plugs for the AC input and transmitter probe heater wiring. Remove the AC Relay Board completely from the Xi enclosure.
6. Partially slide the new AC Relay Board into the Xi enclosure. Ensure the board is correctly aligned within the slots in the enclosure.
7. Connect the two 3-position plugs for the AC input and transmitter probe heater wiring. Slide the AC Relay Board fully into the Xi enclosure.

Figure 6-7. I/O & AC Relay Board Flame Safety Interlock Wiring



8. Reinstall wiring for Relay In. See Figure 6-7 for wiring diagram.
9. Swing the cover up in place and tighten the four screws.

⚠CAUTION

Installing and configuring an AC Relay Board for the Flame Status Interlock function will dedicate alarm output 2 for this function. Once configured for Flame Status Interlock, the software will override any previous alarm assignments for alarm output 2 and not allow it to be used for any other function.

Adding an AC Relay Board to the Xi

1. Loosen the four screws securing the Xi cover. The screws are captive and do not need to be completely removed.
2. Swing the Xi cover down to expose the inner components.
3. Slide the I/O Board part way out of the Xi enclosure.
4. Make the following jumper and switch settings:
 - a. Set SW4, Position 4 "ON" and all other positions "OFF".
 - b. Move the jumpers for both JP1 and JP2 to pins 1 and 2.
5. The I/O Board must be relocated to the right-most slot inside the Xi enclosure. If there is enough service loop on the existing wiring, slide the I/O Board completely out of the enclosure and re-install it in the right-most slot. Ensure the board is correctly aligned within the slots. See Figure 6-8 for the correct location of the I/O Board.

NOTES

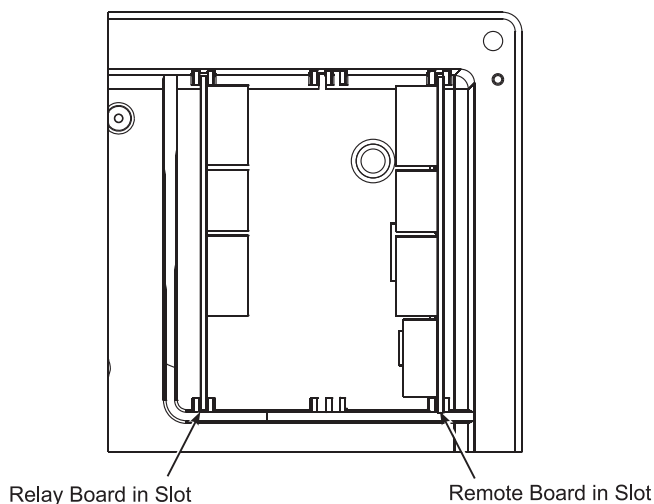
An AC Relay Board can only be added to single channel Xi, i.e. only one I/O Board controlling one O₂ Probe.

The Flame Status Interlock function requires a contact closure on the digital input of the I/O Board to indicate a flame is present. When properly connected and configured, AC power will be applied to the transmitter only when the flame is present.

6. If there is not sufficient wiring, tag and disconnect all wiring, and relocate the board. Then reinstall the wiring.
7. Partially slide the AC Relay Board into the left-most slot of the Xi enclosure. The component side of the AC Relay board will be to the right with the fuse holder at the top. Ensure the board is correctly aligned within the slots in the enclosure. See Figure 6-8 for the correct location of the AC Relay Board.

8. Connect two wires approximately 6" long each between the "HTR COM" and the "HTR NC" connections on the I/O Board and the "RELAY IN" connections on the AC Relay Board; observe polarity. See Figure 6-7 for wiring details.
9. Connect the flame status indicator contact to the "DI+" and "DI-" on the AC Relay Board. See Figure 6-7 for wiring details.
10. Connect the AC input and output wiring to the Transmitter. See Figure 6-7 for wiring details.
11. Slide the AC Relay Board completely into the Xi enclosure.
12. Swing the cover up in place and tighten the four screws.

Figure 6-8. I/O and AC Relay Board Position in Xi Enclosure



40200019

Power Supply Board Replacement

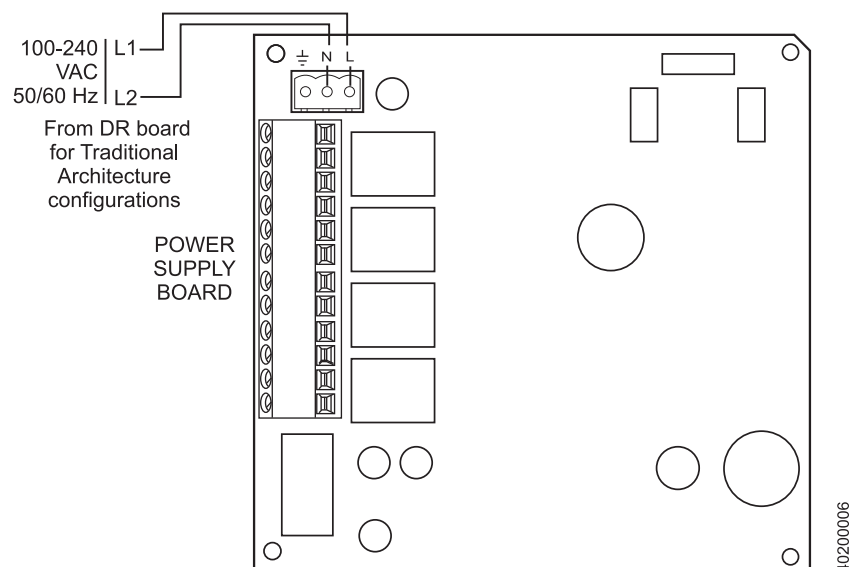
Use the procedure that follows to replace the Power Supply board in the Xi. Use this procedure to replace an original Linear Power Supply board or the current configuration Switching Power Supply board.

⚠ WARNING

Disconnect and lock out power before working on any electrical components.

1. Loosen the four screws securing the Xi cover. The screws are captive and do not need to be completely removed.
2. Swing the Xi cover down to expose the inner components.
3. Refer to the wiring diagram in Figure 6-9. Unplug the AC input wiring plug from the Power Supply board. A new plug is supplied in the replacement kit and should be used if the existing plug is damaged.
4. Disconnect the 14-pin ribbon cable from the Power Supply board.
5. Remove the two long screws that secure the bracket (9, Figure 6-1) to the Xi enclosure.
6. Hold the AC input wiring to the right and slide the Power Supply board out of the Xi enclosure.
7. Install the new mounting bracket (9, Figure 6-1) on the new Power Supply board (10, Figure 6-1). A new bracket and mounting screws are provided in the replacement kit.
8. Slide the Power Supply board into the mating slots in the Xi Enclosure. Make sure the board is correctly aligned in the slots.
9. Install and tighten the bracket mounting screws. Two new screws are provided in the replacement kit and should be used if the existing screws are damaged.

Figure 6-9. Power Supply Board Wiring



Xi Front Panel Replacement

10. Connect the ribbon cable to the Power Supply board. A new ribbon cable (7, Figure 6-1) is provided in the replacement kit and should be used if the existing cable is damaged.
11. Connect the AC power plug to the Power Supply board.
12. Swing the Xi cover up and tighten the four mounting screws.

Use the procedure that follows to replace the front panel on the Xi. Replacement kits with and without the CPU board are available. Use the instructions that apply to the replacement kit you have.

WARNING

Disconnect and lock out power before working on any electrical components.

Replacing Front Panel Assembly without CPU Board

1. Loosen the four screws securing the Xi cover. The screws are captive and do not need to be completely removed.
2. Swing the Xi cover down to expose the inner components.
3. Disconnect the 14-pin ribbon cable going to the Power Supply board. A new cable is supplied in the replacement kit and should be used if the old one is damaged.
4. Disconnect the 10-pin ribbon cable(s) going to the I/O Board(s). One new cable is supplied in the replacement kit and should be used if either of the ribbon cables are damaged.
5. Remove the wire hinge from the right side of the Xi cover. A paper clip or similar device can be inserted into the hole on the left side of the cover to push the hinge out of the cover. A new hinge pin is supplied in the replacement kit and should be used if the old one is damaged.
6. Position the new front panel assembly in place and reinstall the hinge pin. Ensure the hinge pin is fully seated into the Xi cover.

CAUTION

The new front panel assembly may be supplied with protective clear membranes over the interior and exterior of the window. Failure to remove the exterior protective membrane may cause the display to appear distorted. The membrane may be difficult or impossible to remove after extended use at elevated temperatures.

7. The keypad window on the new front panel may be supplied with interior and exterior protective membranes. Remove the protective membranes prior to final assembly and use of the Xi enclosure.
8. Reconnect the 10-pin ribbon cable from the I/O Board.
9. Reconnect the 14-pin ribbon cable from the Power Supply Board.
10. Swing the Xi cover up in place and tighten the four screws.
11. If necessary, reconfigure the appearance of the main display. Refer to Section 3: Configuration of Xi Electronics.

Replacing Front Panel Assembly without CPU Board

1. Loosen the four screws securing the Xi cover. The screws are captive and do not need to be completely removed.
2. Swing the Xi cover down to expose the inner components.
3. Disconnect the 14-pin ribbon cable going to the Power Supply board. A new cable is supplied in the replacement kit and should be used if the old one is damaged.
4. Disconnect the 10-pin ribbon cable(s) going to the I/O Board(s). One new cable is supplied in the replacement kit and should be used if either of the ribbon cables are damaged.
5. Remove the wire hinge from the right side of the Xi cover. A paper clip or similar device can be inserted into the hole on the left side of the cover to push the hinge out of the cover. A new hinge pin is supplied in the replacement kit and should be used if the old one is damaged.
6. Place the front panel assembly on the bench. Remove the 4 screws securing the CPU board to the front cover.

NOTE

Prior to disassembly, observe the position of the plastic bumper with rubber insert as it is installed over the CPU board. The two longer screws are used on the top edge of the CPU board passing through the bumper.

7. Lift the CPU board off of the front cover using care not to damage the board.
8. Disconnect the keypad overlay ribbon cable from the CPU board. Discard the used front cover with the keypad overlay attached.

⚠ CAUTION

The new front panel assembly may be supplied with protective clear membranes over the interior and exterior of the window. Failure to remove the exterior protective membrane may cause the display to appear distorted. The membrane may be difficult or impossible to remove after extended use at elevated temperatures.

9. The keypad window on the new front panel may be supplied with interior and exterior protective membranes. Remove the protective membranes prior to final assembly and use of the Xi enclosure.

NOTE

Prior to assembly, it is recommended that the inside of the keypad overlay window and LCD display window be gently cleaned to remove fingerprints and accumulated dust.

10. Clean the inside of the keypad overlay window and LCD display window to remove fingerprints and accumulated dust. Use only a soft cloth; do not use any detergents or chemicals.
11. Connect the keypad overlay ribbon cable on the new front panel assembly to the CPU board. Use care not to damage the board.
12. Position the CPU board in place in the front panel assembly.

13. Reinstall the bumper and 4 screws to secure the CPU board in place. The two longer screws are used with the plastic bumper on the top edge of the CPU board.
14. Position the front panel assembly and reinstall the hinge pin. Ensure the hinge pin is fully seated into the Xi cover.
15. Reconnect the 10-pin ribbon cable from the I/O Board.
16. Reconnect the 14-pin ribbon cable from the Power Supply Board.
17. Swing the Xi cover up in place and tighten the four screws.
18. If necessary, reconfigure the appearance of the main display. Refer to Section 3: Configuration of Xi Electronics.

DR Board Replacement

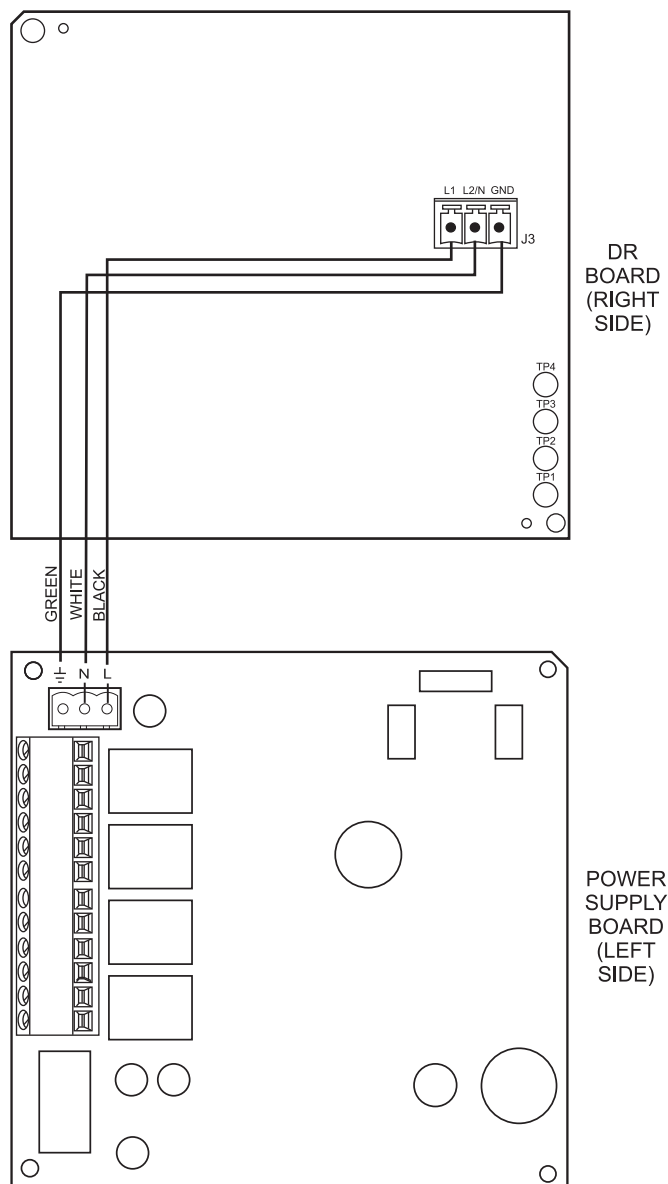
Use the procedure that follows to replace the DR board in the Xi that is connected to a Direct Replacement probe.

WARNING

Disconnect and lock out power before working on any electrical components.

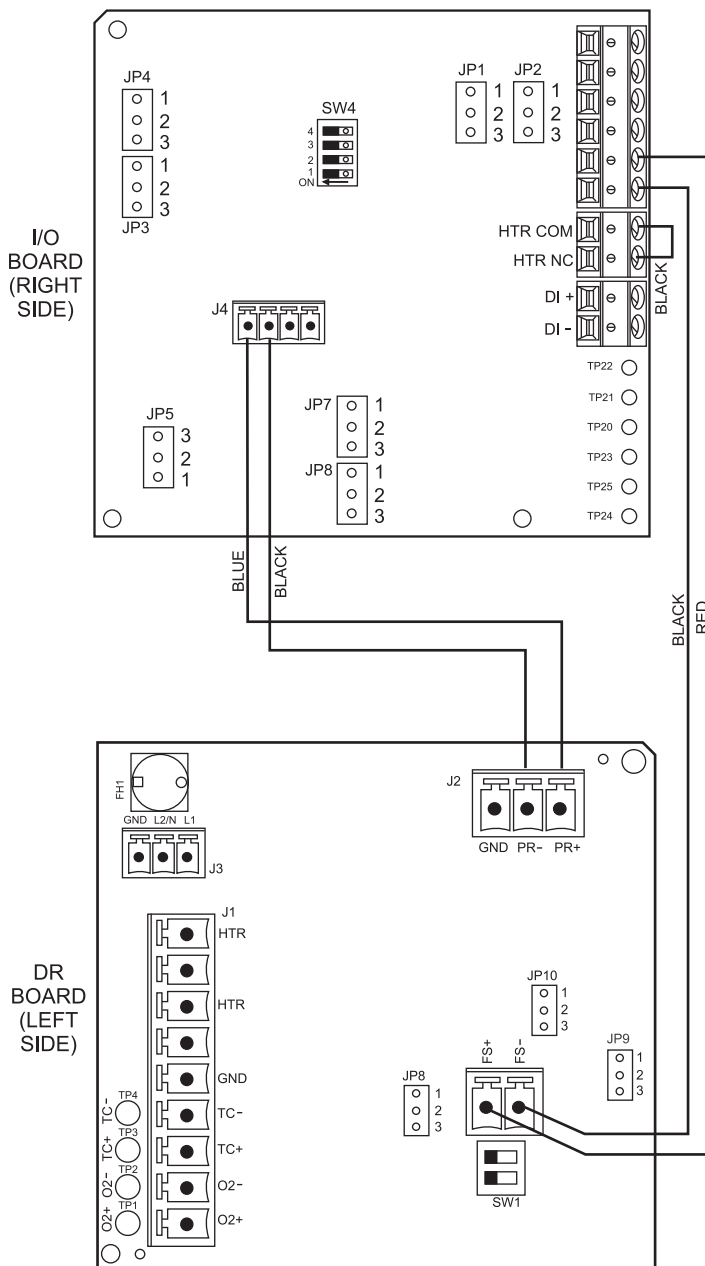
1. Loosen the four screws securing the Xi cover. The screws are captive and do not need to be completely removed.
2. Swing the Xi cover down to expose the inner components.
3. Slide the DR board part way out of the Xi enclosure.
4. Unplug the wiring harness plug from the connector J8 located on the bottom, left-hand side of the board. Refer to Figure 6-10.
5. Unplug the wiring harness plugs from the connectors J1, J2, and J3 located on the top, right-hand side of the board. Refer to Figure 6-11.
6. Tag and disconnect the wiring to connector J4.
7. Remove the DR board from the Xi enclosure.
8. Partially slide the new DR board into the mating slots in the Xi Enclosure. Make sure the board is correctly aligned in the slots.
9. Refer to the wiring diagram in Figure 6-10. Reconnect the wiring to connector J4.
10. Connect the wiring harness plugs to connectors J1, J2, J3, and J8.
11. Slide the DR board completely into the Xi enclosure.
12. Swing the Xi cover up and tighten the four mounting screws.

Figure 6-10. DR Board Wiring,
Right-Hand Side



40200016

Figure 6-11. DR Board Wiring,
Left-Hand Side



40060007

Section 7 Replacement Parts

Xi Electronics	page 7-1
Calibration Components	page 7-2

Xi Electronics

Table 7-1. Replacement Parts
for Xi

Part Number	Description
6A00265G01	Kit, Power Supply Board (Obsolete - Replaced by 6A00329G01)
6A00329G01	Kit, Switching Power Supply Board
6A00266G01	Kit, I/O Board*
6A00267G01	Kit, AC Relay Board
6A00328G01	Kit, DR Board
6A00268G01	Kit, Front Panel with Overlay & CPU Board
6A00268G02	Kit, Front Panel with Overlay
6A00269G01	Enhanced Software Option Upgrade, Stoichiometric Function
6A00269G02	Enhanced Software Option Upgrade, Programmable Reference Function
6A00269G03	Enhanced Software Option Upgrade, 800°C Process Function
6A00237H24	Kit, Pipe & Wall Mount
6A00237H33	Kit, Panel Mount
6A00243G01	Ribbon Cable, 10 Pin (CPU Board to I/O Board)
6A00242G01	Ribbon Cable, 14 Pin (CPU Board to Power Supply Board)
6A00291H01	Insulator
6A00381G01	Kit, Hole Plug & Gland
6A00285H01	Gasket, Panel
6A00287H01	Gasket, Cover

***Note:**

If the existing I/O Board has been operated with the Stoichiometric enhanced software feature, this feature must be activated in the new board before the Xi is put back into service. Failure to do so will cause a false analog output signal to the DCS.

Calibration Components

Table 7-2. Replacement Parts
for Calibration Components

Part Number	Description
1A99119G01	Calibration Gas Bottles - 0.4% and 8% O ₂ , balance nitrogen - 550 liters each*
1A99119G02	Two Flow Regulators (for calibration gas bottles)
1A99119G03	Bottle rack

*Note:

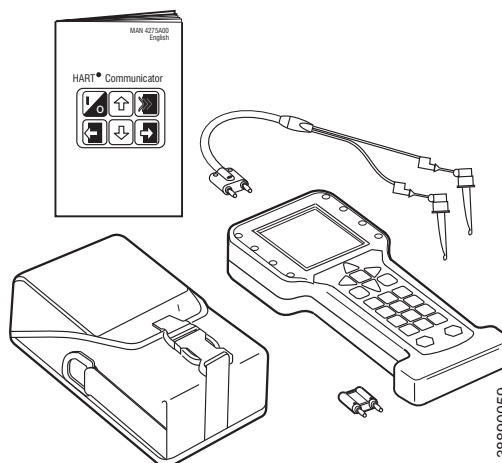
Calibration gas bottles cannot be shipped via airfreight

Section 8 Optional Accessories

HART Handheld 375/475 Field Communicator	page 8-1
Asset Management Solutions (AMS)	page 8-2
By-Pass Packages	page 8-2
SPS 4001B Single Probe Autocalibration Sequencer ...	page 8-3
IMPS 4000 Intelligent Multiprobe Test Gas Sequencer ..	page 8-4
O ₂ Calibration Gas	page 8-5
OxyBalance Display and Averaging System	page 8-6

HART HANDHELD 375/475 FIELD COMMUNICATOR

Figure 8-1. 375/475 Field Communicator



The 375/475 Field Communicator is an interface device that provides a common communication link to HART-compatible instruments, such as the Xi. HART Communications Protocol permits all the information available from the Xi's electronics to be transmitted over standard 4-20 mA signal wires. By attaching the 375/475 Field Communicator at a termination point along the 4-20 mA signal line, a technician can diagnose problems and configure and calibrate the Xi as if he or she were standing in front of the instrument.

For more information, call Rosemount Analytical Inc. at 1-800-433-6076.

ASSET MANAGEMENT SOLUTIONS (AMS)

Asset Management Solutions (AMS) software works in conjunction with the HART Communication Protocol and offers the capability to communicate with all HART plant devices from a single computer terminal.

For more information, call Rosemount Analytical Inc. at 1-800-433-6076.

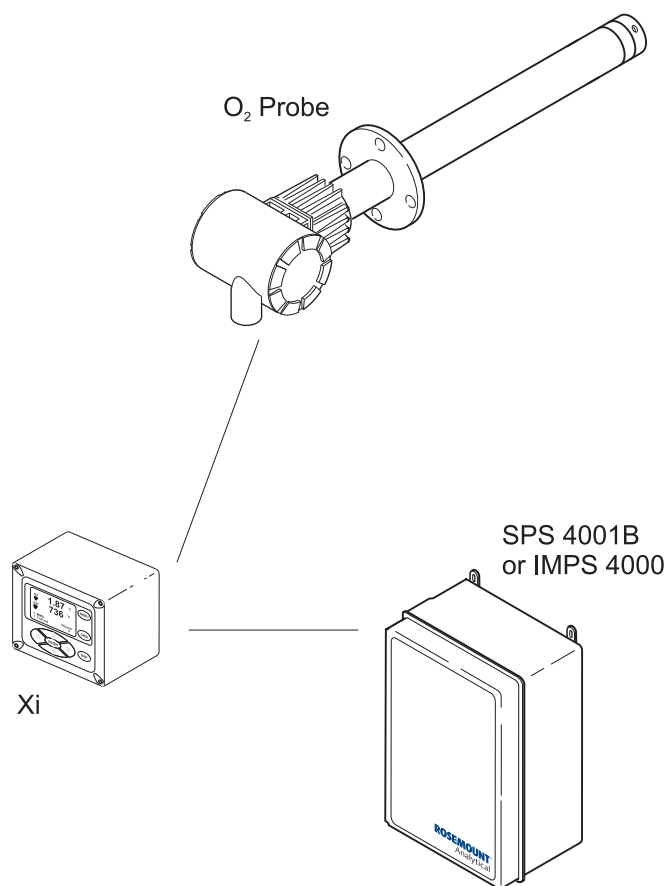
BY-PASS PACKAGES

The specially designed Rosemount Analytical By-Pass Package for oxygen analyzers has proven to withstand the high temperatures in process heaters while providing the same advantages offered by the in situ sensor. Inconel steel tubes provide effective resistance to corrosion, and the package uses no moving parts, air pumps, or other components common to other sampling systems.

For more information, call Rosemount Analytical Inc. at 1-800-433-6076.

**SPS 4001B
SINGLE PROBE
AUTOCALIBRATION
SEQUENCER**

Figure 8-2. SPS 4001B



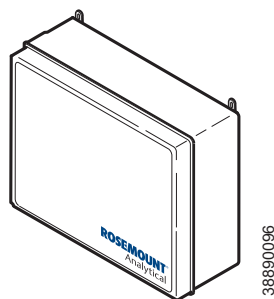
Rosemount Analytical Inc. specifically designed the SPS 4001B Single Probe Autocalibration Sequencer to provide the capability to perform automatic or on-demand calibrations. The SPS 4001B is fully enclosed in a NEMA cabinet suited for wall-mounting. This cabinet provides added protection against dust and minor impacts.

The SPS 4001B works in conjunction with the Xi, eliminating out-of-calibration occurrences and the need to send a technician to the installation site.

For more information, call Rosemount Analytical Inc. at 1-800-433-6076.

IMPS 4000 INTELLIGENT MULTIPROBE TEST GAS SEQUENCER

Figure 8-3. IMPS 4000



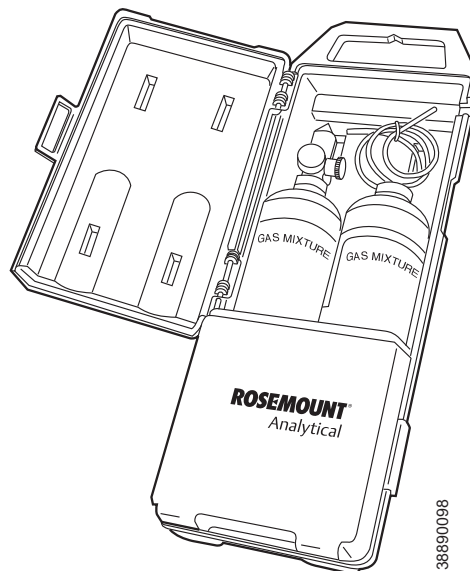
The IMPS 4000 Intelligent Multiprobe Test Gas Sequencer is housed within an IP56 (NEMA 4X) enclosure and has the intelligence to provide calibration gas sequencing of up to four Xi's to accommodate automatic and semi-automatic calibration routines.

This sequencer works in conjunction with the CALIBRATION RECOMMENDED feature, eliminating out-of-calibration occurrences and the need to send a technician to the installation site. In addition, the IMPS 4000 provides a remote contact input to initiate a calibration from a remote location and relay outputs to alert when a calibration is in progress, an O₂ Probe is out of calibration, calibration gases are on, and calibration gas pressure is low.

For more information, call Rosemount Analytical Inc. at 1-800-433-6076.

O₂ CALIBRATION GAS

Figure 8-4. Calibration Gas
Bottles



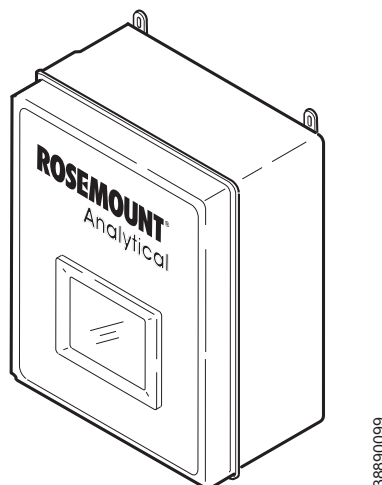
Rosemount Analytical's O₂ Calibration Gas and Service Kits have been carefully designed to provide a more convenient and fully portable means of testing, calibrating, and servicing.

Rosemount Analytical's oxygen analyzers. These lightweight, disposable gas cylinders eliminate the need to rent gas bottles.

For more information, call Rosemount Analytical Inc. at 1-800-433-6076.

OXYBALANCE DISPLAY AND AVERAGING SYSTEM

Figure 8-5. OxyBalance



Optional OxyBalance Display and Averaging System. Reviews up to eight 4-20 mA signals from individual probes. Trends individual outputs, calculates four programmable averages as additional 4-20 mA outputs.

For more information, call Rosemount Analytical Inc. at 1-800-433-6076.

Appendix A XPS Information

XPS Equipment Description	page A-1
Remote XPS for 44V Probes - 6A00358G01	page A-1
Remote XPS for 115V Probes - 6A00358G03	page A-2
Integral XPS 6A00365G01 with Xi (for 44V Probes)	page A-3
Other XPS Uses	page A-3
Specifications	page A-10
Recommended Spare Parts	page A-10

XPS EQUIPMENT DESCRIPTION

The XPS is primarily an interfacing electronics box installed between an O₂ Probe and the Xi electronics. There are three variants of the XPS electronics box, each with specific functions.

1. Remote XPS - 6A00358G01 for 44V Probes
2. Remote XPS - 6A00358G03 for 115V Probes
3. Integral XPS - 6A00365G01 for 44V Probes

Remote XPS for 44V Probes - 6A00358G01

This version of the XPS is for use with Westinghouse/Rosemount Analytical World Class probes that use a 44 volt heater, and when the O₂ Probe uses a 120/240V, 50/60Hz power source. The 6A00358G01 version contains electronics to receive and process multiple raw signals from the probe.

Signal wires between the O₂ Probe and the G01 version XPS include the following:

1. Thermocouple - 2 conductors (type K lead wire)
2. Sensing Cell - 2 conductors
3. Heater - 3 conductors
4. Shield

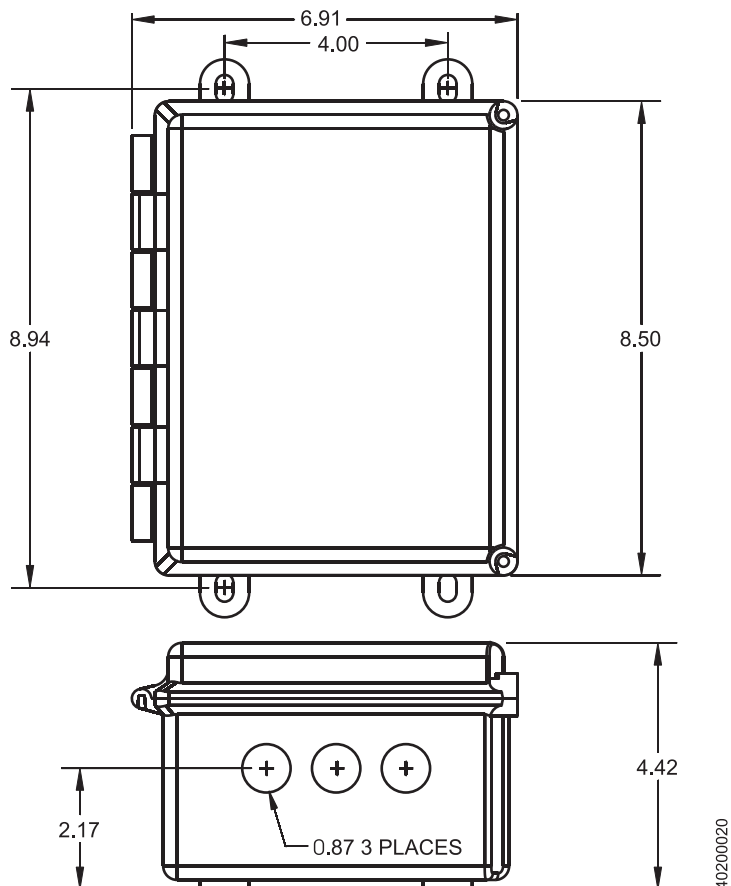
This version of the XPS provides for probe heater control and signal conditioning. The signal conditioning electronics result in a linear 4-20 mA %O₂ signal.

No operator interface is included. Thereby, the 4-20 mA signal typically goes to a Xi Advanced electronics unit. Alternately, a handheld HART 375/475 Field Communicator can be used as the operator interface. However, the Xi or the field communicator must be the dedicated communication device. The Xi and the field communicator cannot be used at the same time.

For heater control the G01 version of the XPS includes a transformer. The transformer converts 120/240V AC input power to the 44V AC heater voltage used in the Westinghouse/Rosemount Analytical World Class probe.

Figure A-1. Remote XPS
6A00358G01 and 6A00358G03
Mounting

- Notes:** 1. Customer must provide suitable cable/conduit entry to meet Type 4X and IP66.
2. All dimensions are in inches.



Remote XPS for 115V Probes - 6A00358G03

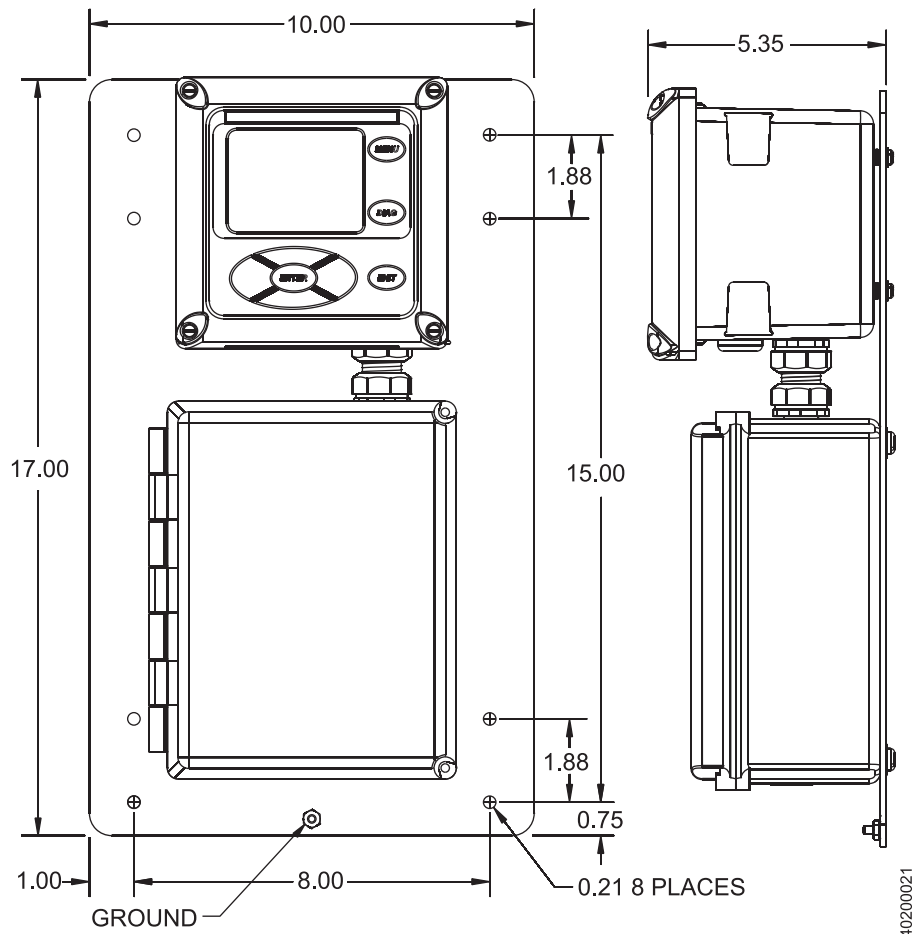
The 6A00358G03 version of the XPS is similar to the 6A00358G01 described above except that it does not include the transformer. The 6A00358G03 version controls any Westinghouse/Rosemount Analytical O₂ probe that uses a 115V heater. Applicable probes include Models 218 and 218A, Oxymitter, X-STREAM, or Model 6888 probes.

Integral XPS 6A00365G01 with Xi (for 44V Probes)

This XPS equipment configuration includes the XPS and a Xi Advanced Electronics unit installed on a common mounting plate. This configuration is intended to replace a World Class Intelligent Field Transmitter (IFT) where the required input line voltage is 120/240V AC, particularly for 240 VAC applications.

Figure A-2. Integral XPS with Xi and 6A00365G01 Mounting

- Notes:** 1. Customer must provide suitable cable/conduit entry to meet Type 4X and IP66.
2. Mounting holes for integral XPS panel reflect same hole patterns used for the WC3000 IFT, P/N 1U05717GXX (blue box) and P/N 6A00178GXX (gray box).
3. All dimensions are in inches.



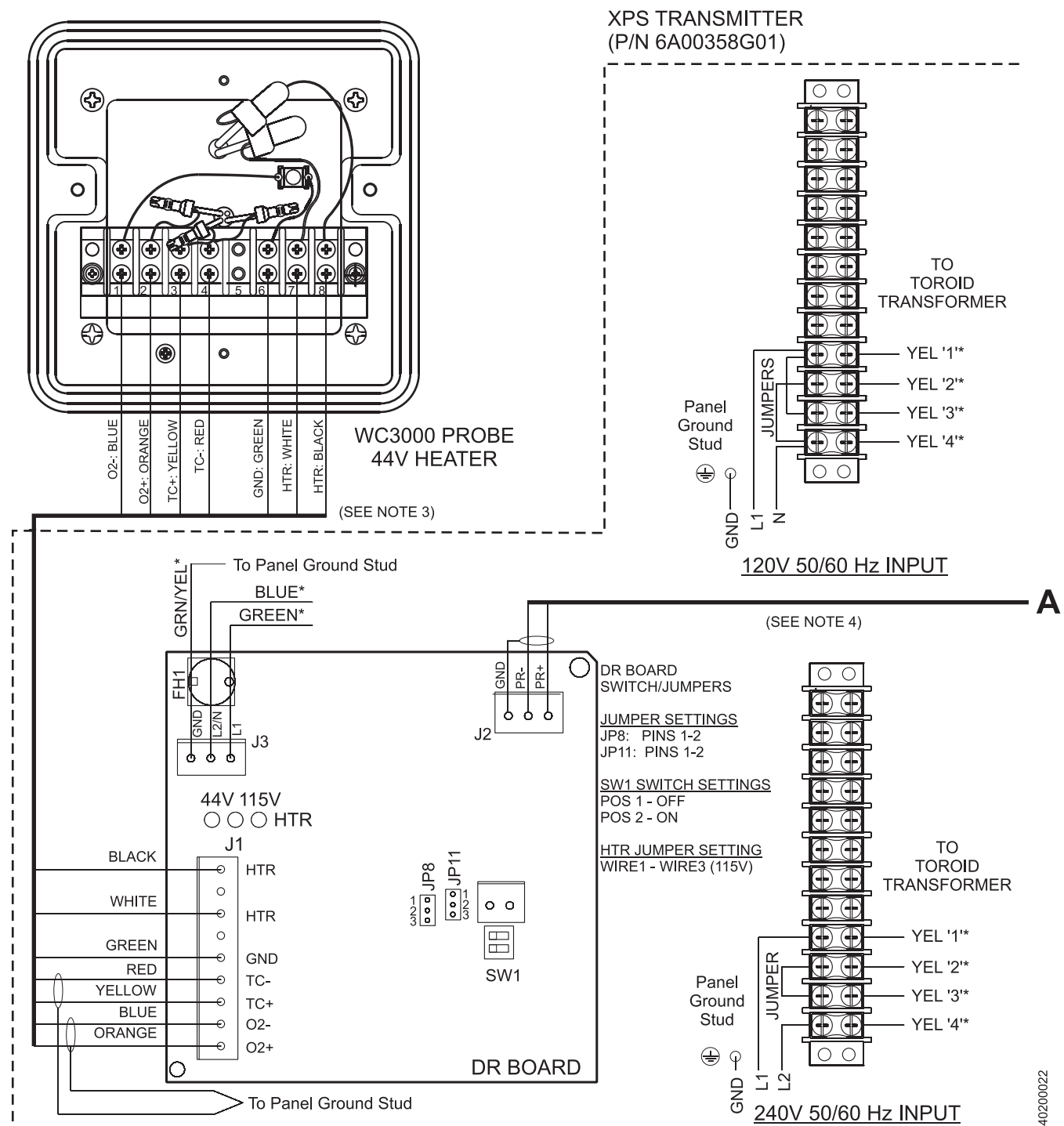
Other XPS Uses

Two XPS units can be wired to two O₂ Probes and back to one dual-channel Xi. This avoids having to purchase a Xi for each probe and eliminates one of two signal cables that would otherwise be required to communicate between the Xi and XPS units.

Figure A-3. Remote XPS 6A00358G01 Wiring Diagram (Sheet 1 of 2)

Notes:

1. All wiring marked with an asterisk (*) is factory wiring inside the XPS.
2. Except for JP7 and JP8 on I/O board, jumper and switch settings are factory set and shown for reference only.
3. Disconnect probe cable from HPS and re-terminate to XPS retaining existing cable gland.
4. Disconnect signal cable from HPS and IFT. Re-terminate to XPS and Xi remote using single, shielded, twisted pair from existing cable. Cut remaining wires flush with cable jacket.



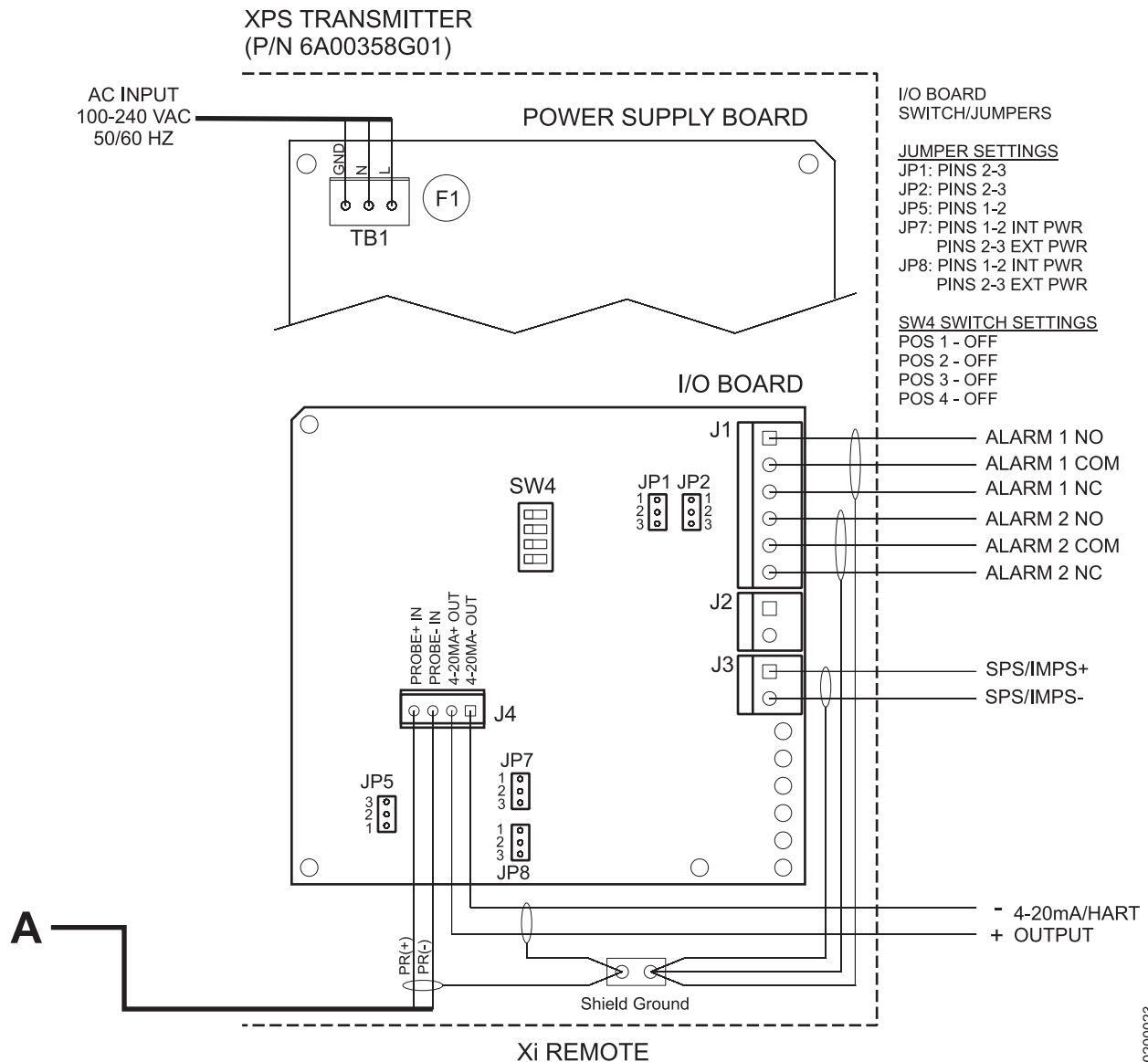
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Figure A-3. Remote XPS 6A00358G01 Wiring Diagram (Sheet 2 of 2)

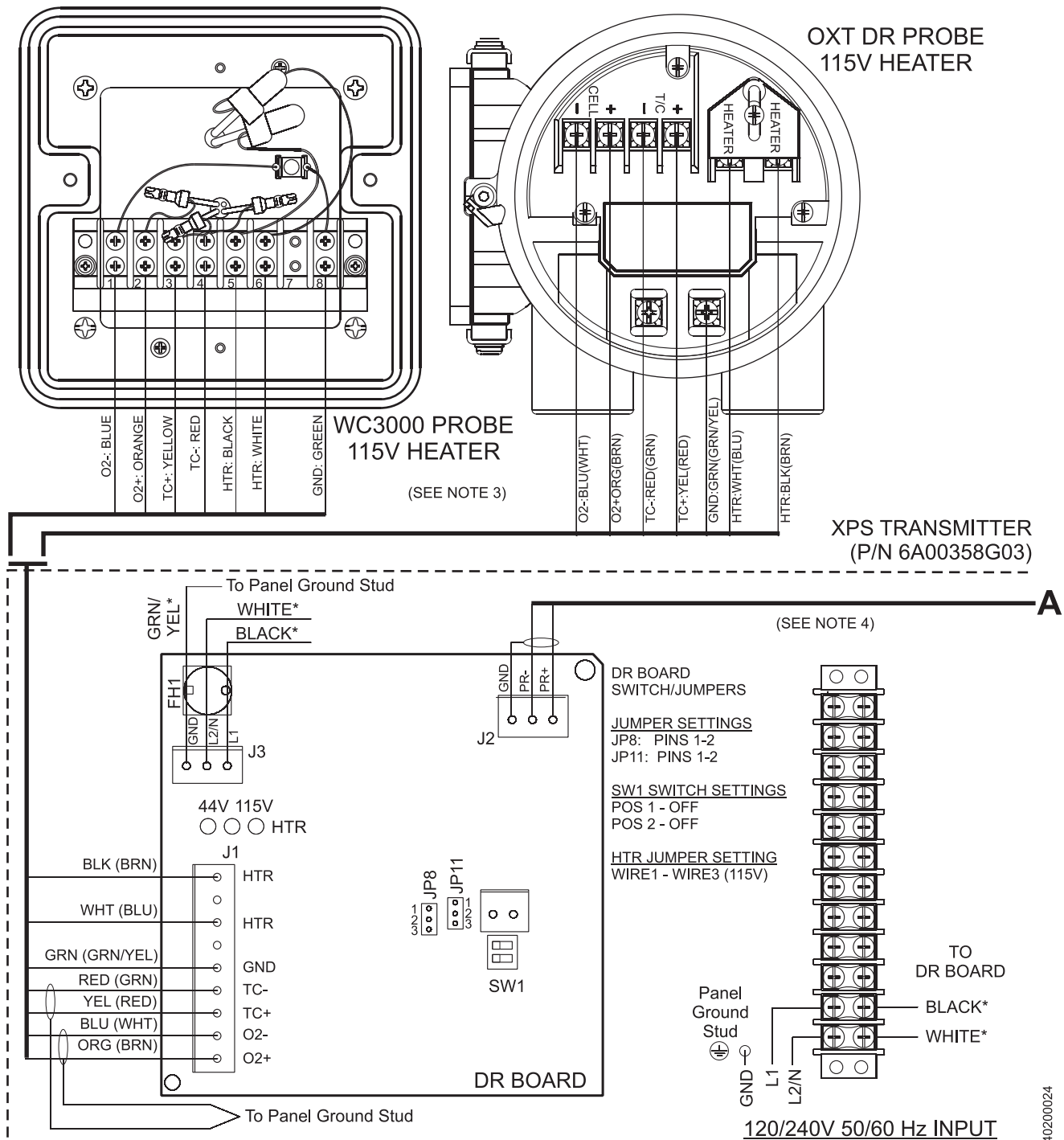


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Figure A-4. Remote XPS 6A00358G03 Wiring Diagram (Sheet 1 of 2)

Notes:

1. All wiring marked with an asterisk (*) is factory wiring inside the XPS.
2. Except for JP7 and JP8 on I/O board, jumper and switch settings are factory set and shown for reference only.
3. Disconnect probe cable from HPS and re-terminate to XPS retaining existing cable gland.
4. Disconnect signal cable from HPS and IFT. Re-terminate to XPS and Xi remote using single, shielded, twisted pair.



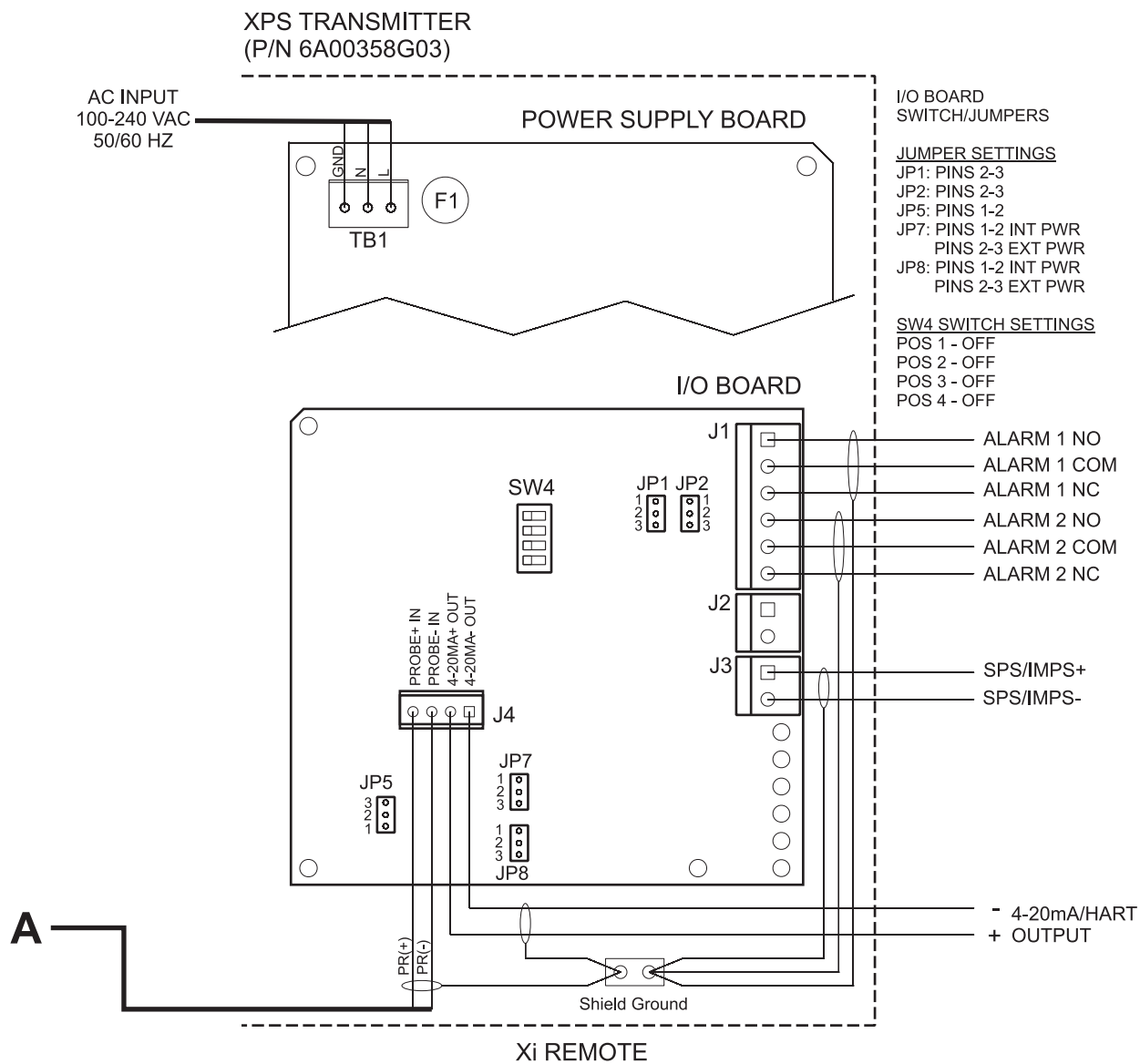
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Figure A-4. Remote XPS 6A00358G03 Wiring Diagram (Sheet 2 of 2)



Notes:

1. All wiring marked with an asterisk (*) is factory wiring inside the XPS.
2. Except for JP7 and JP8 on I/O board, jumper and switch settings are factory set and shown for reference only.
3. Disconnect probe cable from HPS and re-terminate to XPS retaining existing cable gland.



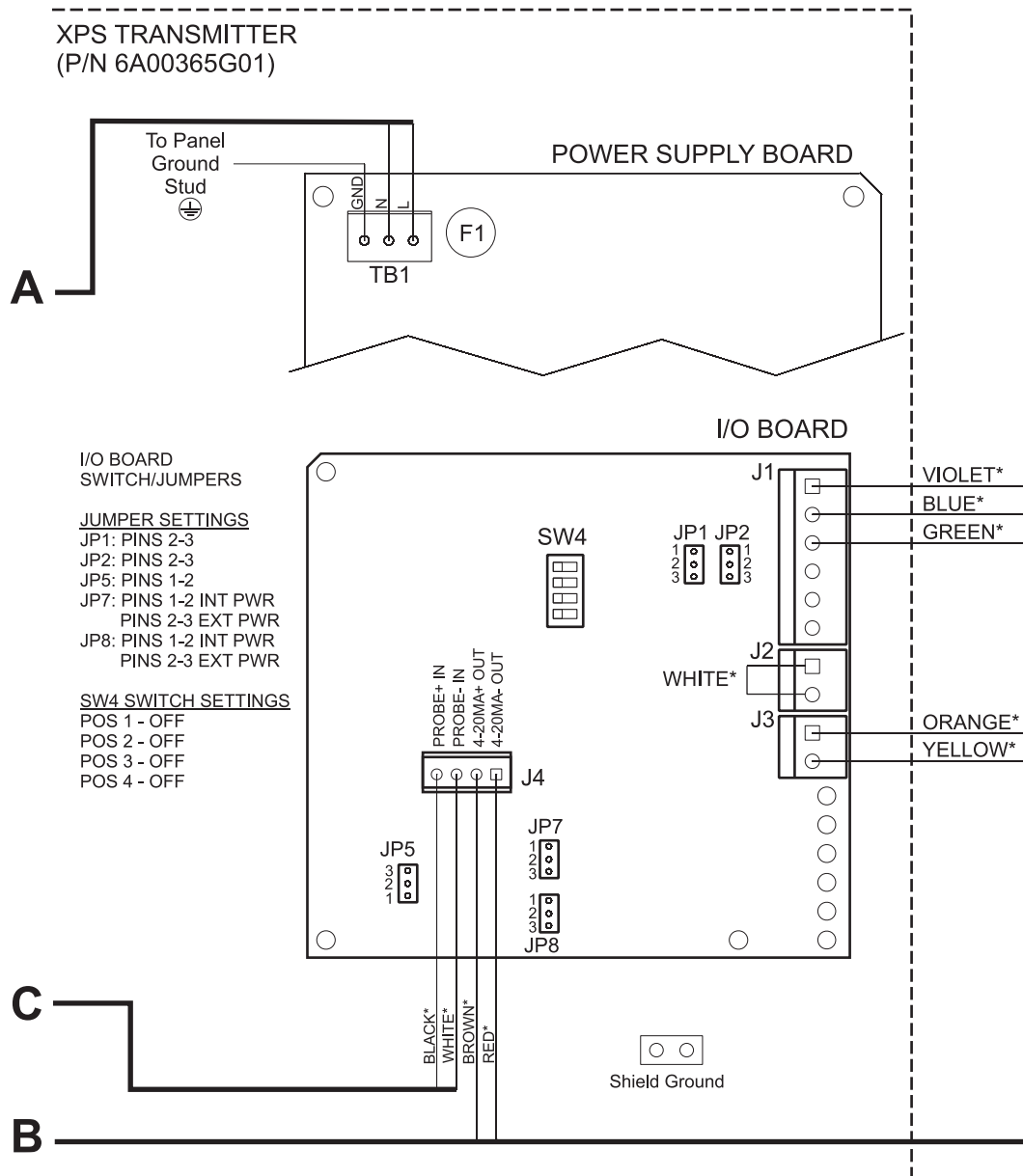
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Xi Advanced Electronics

Figure A-5. Integral XPS 6A00365G01 Wiring Diagram (Sheet 2 of 2)



SPECIFICATIONS

Part Number	Description
6A00358G01 for 44V Probes	120/240V, 50/60 Hz, 140VA, -20°C to +55°C, 95% Relative Humidity, Type 4X, IP66
6A00358G03 for 120V Probes	120/240V, 50/60 Hz, 776VA, -20°C to +55°C, 95% Relative Humidity, Type 4X, IP66
6A00365G01 for 44V Probes	120/240V, 50/60 Hz, 140VA, -20°C to +55°C, 95% Relative Humidity, Type 4X, IP66
General Purpose Certifications:	 

RECOMMENDED SPARE PARTS

Table A-1. Spare Parts

Part Number	Description
1A99763H01	Kit, Replacement Enclosure Mounting Feet
6A00418G01	Kit, DR Board
6A00419G01	Kit, Toroid Transformer
6A00420G01	Kit, Fuses (Reference 3.15 A, 250V, Littlefuse P/N 218 3.15)

Appendix B Safety Data




Safety Instructions	page B-2
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SAFETY INSTRUCTIONS

IMPORTANT

SAFETY INSTRUCTIONS FOR THE WIRING AND INSTALLATION OF THIS APPARATUS

The following safety instructions apply specifically to all EU member states. They should be strictly adhered to in order to assure compliance with the Low Voltage Directive. Non-EU states should also comply with the following unless superseded by local or National Standards.

1. Adequate earth connections should be made to all earthing points, internal and external, where provided.
2. After installation or troubleshooting, all safety covers and safety grounds must be replaced. The integrity of all earth terminals must be maintained at all times.
3. Mains supply cords should comply with the requirements of IEC227 or IEC245.
4. All wiring shall be suitable for use in an ambient temperature of greater than 75°C.
5. All cable glands used should be of such internal dimensions as to provide adequate cable anchorage.
6. To ensure safe operation of this equipment, connection to the mains supply should only be made through a circuit breaker which will disconnect all circuits carrying conductors during a fault situation. The circuit breaker may also include a mechanically operated isolating switch. If not, then another means of disconnecting the equipment from the supply must be provided and clearly marked as such. Circuit breakers or switches must comply with a recognized standard such as IEC947. All wiring must conform with any local standards.
7. Where equipment or covers are marked with the symbol to the right, hazardous voltages are likely to be present beneath. These covers should only be removed when power is removed from the equipment - and then only by trained service personnel. 
8. Where equipment or covers are marked with the symbol to the right, there is a danger from hot surfaces beneath. These covers should only be removed by trained service personnel when power is removed from the equipment. Certain surfaces may remain hot to the touch. 
9. Where equipment or covers are marked with the symbol to the right, refer to the Operator Manual for instructions. 
10. All graphical symbols used in this product are from one or more of the following standards: EN61010-1, IEC417, and ISO3864.
11. Where equipment or labels are marked "Do Not Open While Energized" or similar, there is a danger of ignition in areas where an explosive atmosphere is present. This equipment should only be opened when power is removed and adequate time as specified on the label or in the instruction manual has been allowed for the equipment to cool down - and then only by trained service personnel.

DŮLEŽITÉ

Bezpečnostní pokyny pro zapojení a instalaci zařízení

Následující bezpečnostní pokyny se speciálně vztahují na všechny členské státy EU. Pokyny by měly být přísně dodržovány, aby se zajistilo splnění Směrnice o nízkém napětí. Pokud nejsou pokyny nahrazeny místními či národními normami, měly by je dodržovat i nečlenské státy EU.




1. U všech zemnicích bodů, interních a externích, by mělo být vytvořeno odpovídající uzemnění.
2. Po instalaci nebo odstranění problémů musí být vyměněny všechny bezpečnostní kryty a uzemnění. Vždy musí být zajištěna integrita všech zemnicích svorek.
3. Síťové kabely by měly odpovídat požadavkům normy IEC227 nebo IEC245.
4. Všechna zapojení by měla být vhodná pro použití při vnějších teplotách nad 75 °C.
5. Všechna použitá kabelová hrdla by měla mít takové vnitřní rozměry, aby zajistila odpovídající zakotvení kabelu.
6. Správnou činnost zařízení zajistíte, vytvoříte-li připojení k napájecímu zdroji pouze přes jistič, který v případě poruchy odpojí všechny obvody s konduktory. Jistič může také obsahovat mechanický odpojovač. Pokud ho neobsahuje, musí být zajištěn a jasně označen jiný způsob odpojení zařízení od zdroje. Jističe nebo přepínače musí odpovídat uznávaným normám, např. IEC947. Všechna zapojení musí odpovídat místním normám.
7. Je-li zařízení nebo kryt označen symbolem na pravé straně, pravděpodobně se uvnitř nachází nebezpečné napětí. Tyto kryty by měly být sejmuty pouze po odpojení zařízení od zdroje - a to pouze kvalifikovaným zaměstnancem.
8. Je-li zařízení nebo kryt označen symbolem na pravé straně, povrch zařízení může být velmi horký. Tyto kryty by měly být sejmuty pouze kvalifikovaným zaměstnancem po odpojení zařízení od zdroje. Některé povrchy mohou být stále horké.
9. Je-li zařízení nebo kryt označen symbolem na pravé straně, přečtěte si nejprve instrukce v návodu k obsluze.
10. Všechny grafické symboly používané u výrobku pocházejí z následujících norem: EN61010-1, IEC417 a ISO3864.
11. Pokud je zařízení nebo štítky označeno varováním „Je-li zařízení pod napětím, neotvírejte jej“ či podobným, může dojít ve výbušném prostředí ke vznícení. Zařízení lze otevřít pouze po jeho odpojení od zdroje a ponechání dostatečného času na vychladnutí, jak je uvedeno na štítku nebo v návodu k obsluze - a to pouze kvalifikovaným zaměstnancem.



VIGTIGT

Sikkerhedsinstruktion for tilslutning og installation af dette udstyr.

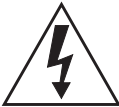


Følgende sikkerhedsinstruktioner gælder specifikt i alle EU-medlemslande. Instruktionerne skal nøje følges for overholdelse af Lavspændingsdirektivet og bør også følges i ikke EU-lande medmindre andet er specificeret af lokale eller nationale standarder.

1. Passende jordforbindelser skal tilsluttes alle jordklemmer, interne og eksterne, hvor disse forefindes.
2. Efter installation eller fejlfinding skal alle sikkerhedsdæksler og jordforbindelser reetableres.
3. Forsyningskabler skal opfylde krav specificeret i IEC227 eller IEC245.
4. Alle ledningstilslutninger skal være konstrueret til omgivelsestemperatur højere end 75°C.
5. Alle benyttede kabelforskrutninger skal have en intern dimension, så passende kabelafastning kan etableres.
6. For opnåelse af sikker drift og betjening skal der skabes beskyttelse mod indirekte berøring gennem afbryder (min. 10A), som vil afbryde alle kredsløb med elektriske ledere i fejlsituation. Afbryderen skal indholde en mekanisk betjent kontakt. Hvis ikke skal anden form for afbryder mellem forsyning og udstyr benyttes og mærkes som sådan. Afbrydere eller kontakter skal overholde en kendt standard som IEC947.
7. Hvor udstyr eller dæksler er mærket med dette symbol, er farlige spændinger normalt forekom-mende bagved. Disse dæksler bør kun afmonteres, når forsyningsspændingen er frakoblet - og da kun af instrueret servicepersonale. 
8. Hvor udstyr eller dæksler er mærket med dette symbol, forefindes meget varme overflader bagved. Disse dæksler bør kun afmonteres af instrueret servicepersonale, når forsyningsspænding er frakoblet. Visse overflader vil stadig være for varme at berøre i op til 45 minutter efter frakobling. 
9. Hvor udstyr eller dæksler er mærket med dette symbol, se da i betjeningsmanual for instruktion. 
10. Alle benyttede grafiske symboler i dette udstyr findes i én eller flere af følgende standarder:- EN61010-1, IEC417 & ISO3864.
11. Når udstyr eller etiketter er mærket "Må ikke åbnes, mens udstyret tilføres strøm" eller lignende, er der fare for antændelse i områder, hvor der er en eksplosiv atmosfære. Dette udstyr må kun åbnes, når strømkilden er fjernet, og der er gået tilstrækkelig tid til, at udstyret er kølet ned. Den nødvendige tid hertil er angivet på etiketten eller i brugervejledningen. Udstyret må kun åbnes af en faglært person.

BELANGRIJK

Veiligheidsvoorschriften voor de aansluiting en installatie van dit toestel.

De hierna volgende veiligheidsvoorschriften zijn vooral bedoeld voor de EU lidstaten. Hier moet aan gehouden worden om de onderworpenheid aan de Laag Spannings Richtlijn (Low Voltage Directive) te verzekeren. Niet EU staten zouden deze richtlijnen moeten volgen tenzij zij reeds achterhaald zouden zijn door plaatselijke of nationale voorschriften.

1. Degelijke aardingsaansluitingen moeten gemaakt worden naar alle voorziene aardpunten, intern en extern.
2. Na installatie of controle moeten alle veiligheidsdeksels en -aarding terug geplaatst worden. Ten alle tijde moet de betrouwbaarheid van de aarding behouden blijven.
3. Voedingskabels moeten onderworpen zijn aan de IEC227 of de IEC245 voorschriften.
4. Alle bekabeling moet geschikt zijn voor het gebruik in omgevingstemperaturen, hoger dan 75°C.
5. Alle wartels moeten zo gedimensioneerd zijn dat een degelijke kabel bevestiging verzekerd is.
6. Om de veilige werking van dit toestel te verzekeren, moet de voeding door een stroomonderbreker gevoerd worden (min 10A) welke alle draden van de voeding moet onderbreken. De stroomonderbreker mag een mechanische schakelaar bevatten. Zoniet moet een andere mogelijkheid bestaan om de voedingsspanning van het toestel te halen en ook duidelijk zo zijn aangegeven. Stroomonderbrekers of schakelaars moeten onderworpen zijn aan een erkende standaard zoals IEC947.
7. Waar toestellen of deksels aangegeven staan met het symbool is er meestal hoogspanning aanwezig. Deze deksels mogen enkel verwijderd worden nadat de voedingsspanning werd afgelegd en enkel door getraind onderhoudspersoneel. 
8. Waar toestellen of deksels aangegeven staan met het symbool is er gevaar voor hete oppervlakken. Deze deksels mogen enkel verwijderd worden door getraind onderhoudspersoneel nadat de voedingsspanning verwijderd werd. Sommige oppervlakken kunnen 45 minuten later nog steeds heet aanvoelen. 
9. Waar toestellen of deksels aangegeven staan met het symbool gelieve het handboek te raadplegen. 
10. Alle grafische symbolen gebruikt in dit produkt, zijn afkomstig uit een of meer van de volgende standards: EN61010-1, IEC417 en ISO3864.
11. Op plaatsen waar uitrusting of etiketten zijn voorzien van een melding als "Niet openen bij aanwezigheid van spanning" bestaat er brandgevaar in omgevingen waar een explosieve atmosfeer aanwezig is. Deze uitrusting mag uitsluitend worden geopend wanneer het niet meer onder spanning staat en de uitrusting gedurende de voorgeschreven tijd op het etiket of in de handleiding is afgekoeld - en dan uitsluitend door voldoende opgeleid onderhoudspersoneel.

BELANGRIJK

Veiligheidsinstructies voor de bedrading en installatie van dit apparaat.

Voor alle EU lidstaten zijn de volgende veiligheidsinstructies van toepassing. Om aan de geldende richtlijnen voor laagspanning te voldoen dient men zich hieraan strikt te houden. Ook niet EU lidstaten dienen zich aan het volgende te houden, tenzij de lokale wetgeving anders voorschrijft.

1. Alle voorziene interne- en externe aardaansluitingen dienen op adequate wijze aangesloten te worden.
2. Na installatie, onderhouds- of reparatie werkzaamheden dienen alle beschermdeksels /kappen en aardingen om reden van veiligheid weer aangebracht te worden.
3. Voedingskabels dienen te voldoen aan de vereisten van de normen IEC 227 of IEC 245.
4. Alle bedrading dient geschikt te zijn voor gebruik bij een omgevings temperatuur boven 75°C.
5. Alle gebruikte kabelwartels dienen dusdanige inwendige afmetingen te hebben dat een adequate verankering van de kabel wordt verkregen.
6. Om een veilige werking van de apparatuur te waarborgen dient de voeding uitsluitend plaats te vinden via een meerpole automatische zekering (min.10A) die alle spanningvoerende geleiders verbreekt indien een foutconditie optreedt. Deze automatische zekering mag ook voorzien zijn van een mechanisch bediende schakelaar. Bij het ontbreken van deze voorziening dient een andere als zodanig duidelijk aangegeven mogelijkheid aanwezig te zijn om de spanning van de apparatuur af te schakelen. Zekeringen en schakelaars dienen te voldoen aan een erkende standaard zoals IEC 947.
7. Waar de apparatuur of de beschermdeksels/kappen gemarkeerd zijn met het volgende symbool, kunnen zich hieronder spanning voerende delen bevinden die gevaar op kunnen leveren. Deze beschermdeksels/kappen mogen uitsluitend verwijderd worden door getraind personeel als de spanning is afgeschakeld.
8. Waar de apparatuur of de beschermdeksels/kappen gemarkeerd zijn met het volgende symbool, kunnen zich hieronder hete oppervlakken of onderdelen bevinden. Bepaalde delen kunnen mogelijk na 45 min. nog te heet zijn om aan te raken.
9. Waar de apparatuur of de beschermdeksels/kappen gemarkeerd zijn met het volgende symbool, dient men de bedieningshandleiding te raadplegen.
10. Alle grafische symbolen gebruikt bij dit produkt zijn volgens een of meer van de volgende standaarden: EN 61010-1, IEC 417 & ISO 3864.
11. Op plaatsen waar uitrusting of etiketten zijn voorzien van een melding als "Niet openen bij aanwezigheid van spanning" bestaat er brandgevaar in omgevingen waar een explosieve atmosfeer aanwezig is. Deze uitrusting mag uitsluitend worden geopend wanneer het niet meer onder spanning staat en de uitrusting gedurende de voorgeschreven tijd op het etiket of in de handleiding is afgekoeld - en dan uitsluitend door voldoende opgeleid onderhoudspersoneel.



WICHTIG

Sicherheitshinweise für den Anschluß und die Installation dieser Geräte.

Die folgenden Sicherheitshinweise sind in allen Mitgliedstaaten der europäischen Gemeinschaft gültig. Sie müssen strikt eingehalten werden, um der Niederspannungsrichtlinie zu genügen.

Nichtmitgliedsstaaten der europäischen Gemeinschaft sollten die national gültigen Normen und Richtlinien einhalten.




1. Alle intern und extern vorgesehenen Erdungen der Geräte müssen ausgeführt werden.
2. Nach Installation, Reparatur oder sonstigen Eingriffen in das Gerät müssen alle Sicherheitsabdeckungen und Erdungen wieder installiert werden. Die Funktion aller Erdverbindungen darf zu keinem Zeitpunkt gestört sein.
3. Die Netzspannungsversorgung muß den Anforderungen der IEC227 oder IEC245 genügen.
4. Alle Verdrahtungen sollten mindestens bis 75°C ihre Funktion dauerhaft erfüllen.
5. Alle Kabeldurchführungen und Kabelverschraubungen sollten in Ihrer Dimensionierung so gewählt werden, daß diese eine sichere Verkabelung des Gerätes ermöglichen.
6. Um eine sichere Funktion des Gerätes zu gewährleisten, muß die Spannungsversorgung über mindestens 10 A abgesichert sein. Im Fehlerfall muß dadurch gewährleistet sein, daß die Spannungsversorgung zum Gerät bzw. zu den Geräten unterbrochen wird. Ein mechanischer Schutzschalter kann in dieses System integriert werden. Falls eine derartige Vorrichtung nicht vorhanden ist, muß eine andere Möglichkeit zur Unterbrechung der Spannungszufuhr gewährleistet werden mit Hinweisen deutlich gekennzeichnet werden. Ein solcher Mechanismus zur Spannungsunterbrechung muß mit den Normen und Richtlinien für die allgemeine Installation von Elektrogeräten, wie zum Beispiel der IEC947, übereinstimmen.
7. Mit dem Symbol sind Geräte oder Abdeckungen gekennzeichnet, die eine gefährliche (Netzspannung) Spannung führen. Die Abdeckungen dürfen nur entfernt werden, wenn die Versorgungsspannung unterbrochen wurde. Nur geschultes Personal darf an diesen Geräten Arbeiten ausführen.
8. Mit dem Symbol sind Geräte oder Abdeckungen gekennzeichnet, in bzw. unter denen heiße Teile vorhanden sind. Die Abdeckungen dürfen nur entfernt werden, wenn die Versorgungsspannung unterbrochen wurde. Nur geschultes Personal darf an diesen Geräten Arbeiten ausführen. Bis 45 Minuten nach dem Unterbrechen der Netzzufuhr können derartig Teile noch über eine erhöhte Temperatur verfügen.
9. Mit dem Symbol sind Geräte oder Abdeckungen gekennzeichnet, bei denen vor dem Eingriff die entsprechenden Kapitel im Handbuch sorgfältig durchgelesen werden müssen.
10. Alle in diesem Gerät verwendeten graphischen Symbole entspringen einem oder mehreren der nachfolgend aufgeführten Standards: EN61010-1, IEC417 & ISO3864.
11. Wenn Geräte oder Etiketten mit dem Hinweis "Nicht unter Spannung öffnen" oder ähnlichen Hinweisen versehen sind, besteht in explosionsgefährdeten Umgebungen Entzündungsgefahr. Das Gerät darf nur geöffnet werden, wenn es nicht ans Stromnetz angeschlossen und entsprechend der Zeitangaben auf dem Etikett bzw. in der Betriebsanleitung ausreichend abgekühlt ist. Das Gerät darf nur von geschultem Service-Personal geöffnet werden.



ΣΗΜΑΝΤΙΚΟ

Οδηγίες ασφαλείας για την καλωδίωση και εγκατάσταση της συσκευής




Οι ακόλουθες οδηγίες ασφαλείας εφαρμόζονται ειδικά για όλες τις χώρες μέλη της Ευρωπαϊκής Κοινότητας. Θα πρέπει να ακολουθούνται αυστηρά ώστε να εξασφαλιστεί η συμβατότητα με τις οδηγίες για τη Χαμηλή Τάση. Χώρες που δεν είναι μέλη της Ευρωπαϊκής Κοινότητας θα πρέπει επίσης να ακολουθούν τις οδηγίες, εκτός εάν αυτές αντικαθίστανται από τα Τοπικά ή Εθνικά πρότυπα.

1. Επαρκείς συνδέσεις γείωσης θα πρέπει να γίνονται σε όλα τα σημεία γείωσης, εσωτερικά και εξωτερικά, όπου υπάρχουν.
2. Μετά την εγκατάσταση ή την αντιμετώπιση σφαλμάτων, όλα τα καλύμματα ασφαλείας και οι γειώσεις ασφαλείας πρέπει να επανεγκαθίστανται. Η καλή κατάσταση όλων των ακροδεκτών γείωσης πρέπει να συντηρείται διαρκώς.
3. Τα καλώδια τροφοδοσίας πρέπει να πληρούν τις απαιτήσεις των IEC227 ή IEC245.
4. Όλες οι καλωδιώσεις θα πρέπει να είναι κατάλληλες για χρήση σε θερμοκρασία χώρου υψηλότερη από 75°C.
5. Όλοι οι στυπιοθλίπτες θα πρέπει να είναι τέτοιων εσωτερικών διαστάσεων, ώστε να παρέχουν επαρκή στερέωση των καλωδίων.
6. Για τη διασφάλιση ασφαλούς λειτουργίας αυτής της συσκευής, η σύνδεση τροφοδοσίας θα πρέπει να γίνεται μόνο μέσω ασφαλειοδιακόπτη, ο οποίος θα αποσυνδέει όλους τους ηλεκτροφόρους αγωγούς των κυκλωμάτων, στη διάρκεια κατάστασης σφάλματος. Ο ασφαλειοδιακόπτης μπορεί επίσης να περιλαμβάνει μηχανικό διακόπτη απομόνωσης. Εάν δεν περιλαμβάνει, τότε άλλα μέσα αποσύνδεσης της συσκευής από την τροφοδοσία πρέπει να παροχρηθούν και να σημανθούν σαφώς ως τέτοια. Οι ασφαλειοδιακόπτες ή διακόπτες πρέπει να συμμορφώνονται με αναγνωρισμένα πρότυπα όπως το IEC947. Όλες οι καλωδιώσεις πρέπει να συμμορφώνονται με τα τοπικά πρότυπα.
7. Όπου συσκευές ή καλύμματα είναι σημασμένα με το σύμβολο που εικονίζεται δεξιά, επικίνδυνες τάσεις ενυπάρχουν κάτω από αυτά. Αυτά τα καλύμματα θα πρέπει να αφαιρούνται μόνο όταν έχει αφαιρεθεί η τροφοδοσία από τη συσκευή - και στην περίπτωση αυτή, μόνο από ειδικευμένο τεχνικό προσωπικό. 
8. Όπου συσκευές ή καλύμματα είναι σημασμένα με το σύμβολο που εικονίζεται δεξιά, υπάρχει κίνδυνος από καυτές επιφάνειες κάτω από αυτά. Τέτοια καλύμματα θα πρέπει να αφαιρούνται μόνο από ειδικευμένο τεχνικό προσωπικό, όταν έχει αφαιρεθεί η τροφοδοσία από τη συσκευή. Κάποιες επιφάνειες μπορούν να παραμένουν ζεστές στην αφή. 
9. Όπου συσκευές ή καλύμματα είναι σημασμένα με το σύμβολο που εικονίζεται δεξιά, ανατρέξτε στις οδηγίες χρήσης της συσκευής. 
10. Όλα τα γραφικά σύμβολα που χρησιμοποιούνται σε αυτό το προϊόν είναι από ένα ή περισσότερα από τα εξής πρότυπα: EN61010-1, IEC417 και ISO3864.
11. Όπου συσκευή ή ετικέτα είναι σημασμένη με την ένδειξη "Μην ανοίγετε ενώ βρίσκεται σε λειτουργία" ή άλλη παρόμοια, υπάρχει κίνδυνος ανάφλεξης σε περιοχές με εκρηκτική ατμόσφαιρα. Ο παρών εξοπλισμός πρέπει να ανοίγεται μόνο όταν είναι εκτός ρεύματος και αφού παρέλθει ο κατάλληλος χρόνος που αναγράφεται στην ετικέτα ή στο εγχειρίδιο οδηγιών ώστε να ψυχθεί και μόνο από εκπαιδευμένο προσωπικό συντήρησης.

OLULINE TEAVE

Juhtmestiku ja seadme paigaldamisega seotud ohutusjuhised




Alljärgnevad ohutusjuhised rakenduvad eriti kõigi Euroopa Liidu liikmesriikide suhtes. Antud juhiseid tuleb täpselt järgida, et kindlustada vastavus madalpinge direktiiviga. Euroopa Liitu mittekuuluvad riigid peavad samuti alljärgnevaid juhiseid järgima, va juhul, kui on olemas vastavad kohalikud riiklikud standardid.

1. Ettenähtud maanduspunktide, nii sisemiste kui väliste jaoks tuleb tagada nõuetekohased maaühendused.
2. Pärast paigaldamist või rikketuvastust tuleb kõik turvaümbrised ja turvamaandused uuesti oma kohale seada. Kõigis olukordades tuleb säilitada kõigi maandusklemmide terviklikkus.
3. Toitejuhtmed peavad vastama IEC227 või IEC245 nõuetele.
4. Kogu juhtmestik peab sobima kasutamiseks üle 75°C õhutemperatuuri juures.
5. Kõik juhtmetihendid peavad sisemõõtmete poolest tagama nõuetekohased kaabliühendused.
6. Seadme ohutu töötamise tagamiseks peab ühendus toiteallikaga toimuma vaid läbi automaatkorgi, mis veaolukorras lülitab välja kõik voolukandjad. Automaatkorgil võib olla ka mehhaaniliselt reguleeritav lahkliüliti. Vastasel juhul peab seadme toiteallikast lahtiühendamiseks olema teine ja selgelt osutatud moodus. Automaatkorgid või -lülitid peavad vastama tunnustatud standarditele nagu nt IEC947. Kogu juhtmestik peab vastama kohalikele standarditele.
7. Seadmel või ümbristel asuv paremale osutav sümbol tähistab selle all leiduvat ohtlikku pinget. Selliste sümbolitega ümbriseid võib eemaldada vaid juhul, kui seade on toiteallikast lahti ühendatud ning ka siis ainult vastavate oskustega spetsialisti poolt. 
8. Seadmele või ümbristele märgitud paremale osutava sümboli all valitseb kuumadest pindadest tulenev oht. Nimetatud sümbolitega ümbriseid võib eemaldada vaid vastavate oskustega spetsialist, kui seade on toiteallikast lahti ühendatud. Teatud pinnad võivad puudutamise jaoks liiga kuumad olla. 
9. Seadmel või ümbristel leiduva paremale osutava sümboli korral vt juhiste jaoks Toimimisjuhendit. 
10. Kõik selle toote juures kasutatavad graafilised sümbolid lähtuvad ühest või enamast järgmistest standarditest: EN61010-1, IEC417 ja ISO3864.
11. Kui seadmele või siltidele on kirjutatud "Ärge avage voolutarbimine korral" vms, valitseb plahvatusohtlikus keskkonnas süttimise oht. Seadet võib avada ainult siis, kui toide on lahti ühendatud ning seadmel on võimaldatud sildil või kasutusjuhendis osutatud aja jooksul maha jahtuda -- ning ka sellisel juhul ainult vastavate oskustega spetsialisti poolt.

TÄRKEÄÄ

Turvallisuusohje, jota on noudatettava tämän laitteen asentamisessa ja kaapeloinnissa.

Seuraavat ohjeet pätevät erityisesti EU:n jäsenvaltioissa. Niitä täytyy ehdottomasti noudattaa jotta täytettäisiin EU:n matalajännitedirektiivin (Low Voltage Directive) yhteensopivuus. Myös EU:hun kuulumattomien valtioiden tulee noudattaa tätä ohjetta, elleivät kansalliset standardit estä sitä.

1. Riittävät maadoituskytkennät on tehtävä kaikkiin maadoituspisteisiin, sisäisiin ja ulkoisiin.
2. Asennuksen ja vianetsinnän jälkeen on kaikki suojat ja suojamaat asennettava takaisin paikoilleen. Maadoitusliittimen kunnollinen toiminta täytyy aina ylläpitää.
3. Jännitesyöttöjohtimien täytyy täyttää IEC227 ja IEC245 vaatimukset.
4. Kaikkien johdotuksien tulee toimia >75°C lämpötiloissa.
5. Kaikkien läpivientiholkkien sisähalkaisijan täytyy olla sellainen että kaapeli lukkiutuu kun-nolla kiinni.
6. Turvallisen toiminnan varmistamiseksi täytyy jännitesyöttö varustaa turvakytkimellä (min 10A), joka kytkee irti kaikki jännitesyöttöjohtimet vikatilanteessa. Suojaan täytyy myös sisältyä mekaaninen erotuskytkin. Jos ei, niin jännitesyöttö on pystyttävä katkaisemaan muilla keinoilla ja merkittävä siten että se tunnistetaan sellaiseksi. Turvakytkimien tai katkaisimien täytyy täyttää IEC947 standardin vaatimukset näkyvyydestä.
7. Mikäli laite tai kosketussuoja on merkitty tällä merkillä on merkinnän takana tai alla hengenvaarallisen suuruinen jännite. Suojaa ei saa poistaa jänniteen ollessa kytkettynä laitteeseen ja poistamisen saa suorittaa vain alan asiantuntija. 
8. Mikäli laite tai kosketussuoja on merkitty tällä merkillä on merkinnän takana tai alla kuuma pinta. Suojaa saa poistaa vain alan asiantuntija kun jännitesyöttö on katkaistu. Tällainen pinta voi säilyä kosketuskuumana jopa 45 minuuttia. 
9. Mikäli laite tai kosketussuoja on merkitty tällä merkillä katso lisäohjeita käyttöohjekirjasta. 
10. Kaikki tässä tuotteessa käytetyt graafiset symbolit ovat yhdestä tai useammasta seuraavista standardeista: EN61010-1, IEC417 & ISO3864.
11. Jos laitteessa tai tarrassa on merkintä "Älä avaa, kun virta on kytketty" tai vastaava, räjähdyksenvaarallisissa tiloissa on syttymisen vaara. Nämä laitteet voidaan avata vain silloin, kun virta ei ole kytkettynä ja laitteen on annettu jäähtyä tarrassa tai oppaassa määrätyn ajan. Tällöinkin laitteet saa avata vain koulutettu huoltohenkilökunta.

IMPORTANT

Consignes de sécurité concernant le raccordement et l'installation de cet appareil.

Les consignes de sécurité ci-dessous s'adressent particulièrement à tous les états membres de la communauté européenne. Elles doivent être strictement appliquées afin de satisfaire aux directives concernant la basse tension. Les états non membres de la communauté européenne doivent également appliquer ces consignes sauf si elles sont en contradiction avec les standards locaux ou nationaux.




1. Un raccordement adéquat à la terre doit être effectuée à chaque borne de mise à la terre, interne et externe.
2. Après installation ou dépannage, tous les capots de protection et toutes les prises de terre doivent être remis en place, toutes les prises de terre doivent être respectées en permanence.
3. Les câbles d'alimentation électrique doivent être conformes aux normes IEC227 ou IEC245.
4. Tous les raccordements doivent pouvoir supporter une température ambiante supérieure à 75°C.
5. Tous les presse-étoupes utilisés doivent avoir un diamètre interne en rapport avec les câbles afin d'assurer un serrage correct sur ces derniers.
6. Afin de garantir la sécurité du fonctionnement de cet appareil, le raccordement à l'alimentation électrique doit être réalisé exclusivement au travers d'un disjoncteur (minimum 10A.) isolant tous les conducteurs en cas d'anomalie. Ce disjoncteur doit également pouvoir être actionné manuellement, de façon mécanique. Dans le cas contraire, un autre système doit être mis en place afin de pouvoir isoler l'appareil et doit être signalisé comme tel. Disjoncteurs et interrupteurs doivent être conformes à une norme reconnue telle IEC947.
7. Lorsque les équipements ou les capots affichent le symbole suivant, cela signifie que des tensions dangereuses sont présentes. Ces capots ne doivent être démontés que lorsque l'alimentation est coupée, et uniquement par un personnel compétent.
8. Lorsque les équipements ou les capots affichent le symbole suivant, cela signifie que des surfaces dangereusement chaudes sont présentes. Ces capots ne doivent être démontés que lorsque l'alimentation est coupée, et uniquement par un personnel compétent. Certaines surfaces peuvent rester chaudes jusqu'à 45 mn.
9. Lorsque les équipements ou les capots affichent le symbole suivant, se reporter au manuel d'instructions.
10. Tous les symboles graphiques utilisés dans ce produit sont conformes à un ou plusieurs des standards suivants: EN61010-1, IEC417 & ISO3864.
11. Les équipements comportant une étiquette avec la mention " Ne pas ouvrir sous tension " ou toute autre mention similaire peuvent créer un risque d'incendie dans les environnements explosifs. Ces équipements ne doivent être ouverts que lorsqu'ils sont hors tension et que la durée de refroidissement requise indiquée sur l'étiquette ou dans le manuel d'instructions s'est écoulée. En outre ils ne doivent être ouverts que par un personnel qualifié.



FONTOS

Biztonsági előírások a készülék vezetékéhez és üzembeállításához




A következő biztonsági előírások kifejezetten vonatkoznak az összes EU-tagállamra. Ezeket szigorúan be kell tartani a Kisfeszültségű irányelvnek való megfelelés biztosításához. A nem EU-tagállamok szintén tartssák be a következőket, kivéve ha a helyi és nemzeti szabványok azt másként nem írják elő.

1. A megfelelő földelést biztosítani kell az összes rendelkezésre álló földelési ponton, legyen az belső vagy külső.
2. Az üzembeállítás vagy hibaelhárítás után az összes biztonsági burkolatot és biztonsági földvezetékét ki kell cserélni. A földelőkapcsok sértetlenségét mindig biztosítani kell.
3. A tápvezetékeknek eleget kell tenniük az IEC227 vagy IEC245 szabványokban megfogalmazott követelményeknek.
4. Az összes vezetéknek alkalmasnak kell lennie a 75 °C-nál magasabb környezeti hőmérséklet melletti használatra.
5. Az összes használt kábelvezető tömszelencének olyan belső méretűnek kell lennie, hogy biztosítsák a kábelek megfelelő lekötését.
6. A berendezés biztonságos működésének biztosításához az elektromos hálózathoz való csatlakozást csak megszakítón keresztül szabad megvalósítani, amely az összes áramot szállító vezeték bontja hibahelyzet esetén. A megszakító magában foglalhat egy mechanikusan működtethető áramtalanító kapcsolót is. Ellenkező esetben biztosítani kell a berendezés elektromos hálózatról történő lekapcsolásának más módját, és ezt világosan jelezni kell. A megszakítóknak vagy kapcsolóknak meg kell felelniük egy elismert szabványnak, például az IEC947 szabványnak. Az összes vezetéknek meg kell felelnie az összes helyi szabványnak.
7. Ha a berendezés vagy a burkolata a jobb oldalon látható szimbólummal jelzett, alatta valószínűleg veszélyes feszültség van jelen. Az ilyen burkolat csak a berendezés áramtalanítása után távolítható el - és csak képzett szervizszakember végezheti el. 
8. Ha a berendezés vagy a burkolata a jobb oldalon látható szimbólummal jelzett, fenn áll a veszélye, hogy alatta forró felületek találhatók. Az ilyen burkolatot csak képzett szervizszakember távolíthatja el a berendezés áramtalanítása után. Bizonyos felületek érintésre forróak maradhatnak. 
9. Ha a berendezés vagy a burkolata a jobb oldalon látható szimbólummal jelzett, tekintse meg az Üzemeltetési útmutató arra vonatkozó utasításait. 
10. A terméken használt grafikus szimbólumok a következő szabványok legalább egyikéből származnak: EN61010-1, IEC417 és ISO3864.
11. Ha a berendezésen vagy a címkén a „Ne nyissa ki bekapcsolt állapotban” vagy hasonló felhívás szerepel, robbanásveszélyes környezetben fennáll a gyulladás veszélye. Ez a berendezés csak áramtalanítás után nyitható ki, a címkén vagy a kezelési útmutatóban szereplő, a berendezés lehűlését biztosító megfelelő idői ráhagyás után - és csak képzett szervizszakember végezheti el.

IMPORTANTE

Norme di sicurezza per il cablaggio e l'installazione dello strumento.




Le seguenti norme di sicurezza si applicano specificatamente agli stati membri dell'Unione Europea, la cui stretta osservanza è richiesta per garantire conformità alla Direttiva del Basso Voltaggio. Esse si applicano anche agli stati non appartenenti all'Unione Europea, salvo quanto disposto dalle vigenti normative locali o nazionali.

1. Collegamenti di terra idonei devono essere eseguiti per tutti i punti di messa a terra interni ed esterni, dove previsti.
2. Dopo l'installazione o la localizzazione dei guasti, assicurarsi che tutti i coperchi di protezione siano stati collocati e le messa a terra siano collegate. L'integrità di ciascun morsetto di terra deve essere costantemente garantita.
3. I cavi di alimentazione della rete devono essere secondo disposizioni IEC227 o IEC245.
4. L'intero impianto elettrico deve essere adatto per uso in ambiente con temperature superiore a 75°C.
5. Le dimensioni di tutti i connettori dei cavi utilizzati devono essere tali da consentire un adeguato ancoraggio al cavo.
6. Per garantire un sicuro funzionamento dello strumento il collegamento alla rete di alimentazione principale dovrà essere eseguita tramite interruttore automatico (min.10A), in grado di disattivare tutti i conduttori di circuito in caso di guasto. Tale interruttore dovrà inoltre prevedere un sezionatore manuale o altro dispositivo di interruzione dell'alimentazione, chiaramente identificabile. Gli interruttori dovranno essere conformi agli standard riconosciuti, quali IEC947.
7. Il simbolo riportato sullo strumento o sui coperchi di protezione indica probabile presenza di elevati voltaggi. Tali coperchi di protezione devono essere rimossi esclusivamente da personale qualificato, dopo aver tolto alimentazione allo strumento. 
8. Il simbolo riportato sullo strumento o sui coperchi di protezione indica rischio di contatto con superfici ad alta temperatura. Tali coperchi di protezione devono essere rimossi esclusivamente da personale qualificato, dopo aver tolto alimentazione allo strumento. Alcune superfici possono mantenere temperature elevate per oltre 45 minuti. 
9. Se lo strumento o il coperchio di protezione riportano il simbolo, fare riferimento alle istruzioni del manuale Operatore. 
10. Tutti i simboli grafici utilizzati in questo prodotto sono previsti da uno o più dei seguenti standard: EN61010-1, IEC417 e ISO3864.
11. L'indicazione "Non aprire sotto tensione" o simili sull'apparecchiatura o sulle etichette segnala il pericolo di accensione nelle aree in cui è presente un'atmosfera esplosiva. L'apparecchiatura può essere aperta solo quando l'alimentazione è scollegata ed è trascorso il tempo indicato sull'etichetta o nel manuale delle istruzioni per consentirne il raffreddamento. L'operazione può essere effettuata esclusivamente da personale dell'assistenza qualificato.

SVARBU

Šio prietaiso laidų prijungimo ir instaliacijos saugos instrukcijos




Toliau išvardinti saugumo reikalavimai taikomi konkrečiai visoms ES šalims narėms. Jų turi būti griežtai paisoma, kad būtų užtikrintai laikomasi Žemos įtampos direktyvos. Ne ES narės taip pat turi laikytis toliau pateikiamų reikalavimų nebent juos pakeičia vietiniai ar Nacionaliniai standartai.

1. Turi būti atliktas tinkamas įžeminimas visuose įžeminimo taškuose, vidiniuose ir išoriniuose, kur numatyta.
2. Visos apsauginės dangos ir įžemikliai po instaliacijos ar remonto turi būti pakeisti. Visų įžeminimo terminalų vientisumo priežiūra turi būti atliekama nuolat.
3. Maitinimo tinklo laidai turi atitikti IEC227 ar IEC245 reikalavimus.
4. Visi laidai turi būti tinkami naudojimui aplinkos temperatūroje, aukštesnėje nei 75°C.
5. Visi naudojamų kabelių riebokšliai turi būti tokių vidinių matmenų, kad būtų galimas tinkamas kabelio pritvirtinimas.
6. Saugaus šio prietaiso veikimo užtikrinimui, prijungimas prie maitinimo tinklo turi būti atliekamas tik per automatinį pertraukiklį, kuris atjungs visas grandines nešančius konduktorius linijos gedimo metu. Automatinis pertraukiklis taip pat gali turėti mechaniskai veikiantį izoliavimo jungiklį. Jeigu ne, tuomet turi būti nurodytos kitos įrenginio atjungimo priemonės, ir aiškiai pažymėtos, kad jos tokios yra. Automatiniai perjungikliai ar jungikliai turi atitikti pripažintus standartus, tokius kaip IEC947. Visi laidai turi atitikti visus vietinius standartus.
7. Kur įrenginys ar dangos yra pažymėti simboliu dešinėje, žemiau turi būti pavojinga įtampa. Šios dangos turi būti nuimamos tik tada, kai srovė yra pašalinta iš įrenginio - ir tik tuomet tai turi atlikti apmokytas personalas. 
8. Ten kur įrenginys ar dangos yra pažymėti simboliu dešinėje, ten yra pavojus nuo karštų paviršių apačioje. Šios dangos gali būti nuimamos tik apmokyto personalo, kai srovė yra pašalinta iš įrenginio. Tam tikri paviršiai gali išlikti karšti liečiant. 
9. Ten kur įrenginys ar dangos yra pažymėti simboliu dešinėje, žr. nurodymus Valdymo instrukcijose. 
10. Visi grafiniai simboliai naudojami šiam produktui yra iš vieno ar daugiau toliau išvardintų standartų: EN61010-1, IEC417, ir ISO3864.
11. Ten, kur įrenginys ar etiketės yra pažymėti "Neatidaryti esant srovės tiekimui" ar panašiai, yra užsidegimo pavojus tose vietose, kur yra sprogstamoji atmosfera. Šis įrenginys gali būti atidarytas tuomet, kai yra pašalinta srovė, ir praėjęs atitinkamas laikas, nurodytas etiketėje ar valdymo instrukcijoje, pakankamas įrenginio ataušimui - ir tai tik apmokyto personalo.

SVARĪGI

Drošības norādījumi šīs iekārtas pievienošanai un uzstādīšanai

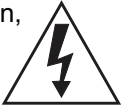


Turpmākie drošības norādījumi attiecas uz visām ES dalībvalstīm. Tie ir stingri jāievēro, lai nodrošinātu atbilstību Zemsprieguma direktīvai. Turpmāk norādītais jāievēro arī valstīs, kas nav ES dalībvalstis, ja vien šos norādījumus neaizstāj vietējie vai valsts standarti.

1. Visi pieejamie iekšējie un ārējie zemējuma punkti ir atbilstoši jāiezemē.
2. Pēc uzstādīšanas vai problēmu risināšanas visi drošības pārsegi un drošības zemējuma savienojumi ir jāpievieno atpakaļ. Visiem zemējuma savienojumiem vienmēr jābūt iezemētiem.
3. Elektropadeves vadiem jāatbilst IEC227 vai IEC245 prasībām.
4. Visai elektroinstalācijai jābūt piemērotai lietošanai apkārtējā temperatūrā, kas pārsniedz 75°C.
5. Visu izmantoto kabeļu blīvju iekšējiem izmēriem jābūt tādiem, lai atbilstoši nostiprinātu kabeli.
6. Lai nodrošinātu šīs iekārtas drošu darbību, savienojums ar elektropadeves tīklu jāizveido, izmantojot slēdzi, kas kļūmes gadījumā atvienos visas ķēdes, kurās ir vadītāji. Slēdzī var būt iestrādāts arī mehānisks pārtraucējslēdzis. Ja tāda nav, tad ir jāuzstāda cita veida ierīce iekārtas atvienošanai no strāvas padeves un tā atbilstoši un skaidri jāmarķē. Slēdžiem jāatbilst kādam vispārātzītam standartam, piemēram, IEC947. Visai elektroinstalācijai jāatbilst vietējiem standartiem.
7. Vietās, kur iekārta vai tās pārsegi ir marķēti ar labajā pusē norādīto simbolu, visticamāk, zem tiem ir bīstams spriegums. Šos pārsegus drīkst noņemt tikai tad, ja iekārta ir atvienota no strāvas padeves, – un šos darbus drīkst veikt tikai atbilstoši apmācīti remontdarbu darbinieki. 
8. Vietās, kur iekārta vai tās pārsegi ir marķēti ar labajā pusē norādīto simbolu, apdraudējumu izraisa zem tiem esošās karstās virsmas. Šos pārsegus drīkst noņemt tikai atbilstoši apmācīti remontdarbu darbinieki, kad iekārta ir atvienota no strāvas padeves. Iespējams, dažas virsmas arī pēc iekārtas atvienošanas paliks karstas. 
9. Ja iekārta vai pārsegi ir marķēti ar labajā pusē esošo simbolu, skatiet operatora rokasgrāmatā ietvertos norādījumus. 
10. Visi šajā izstrādājumā izmantotie grafiskie simboli atbilst vienam vai vairākiem no šiem standartiem: EN61010-1, IEC417 un ISO3864.
11. Ja iekārtai vai uzlīmēm ir marķējums "Neatvērt, kamēr pieslēgta strāvai" vai tamlīdzīga norāde, tas nozīmē, ka sprādzienbīstamā vidē ir uzliesmošanas bīstamība. Šo iekārtu drīkst atvērt tikai tad, ja ir atvienota strāva un ir nogaidīts iekārtas atdzišanai nepieciešamais laiks, kas norādīts uzlīmē vai ekspluatācijas rokasgrāmatā, – un šos darbus drīkst veikt tikai atbilstoši apmācīti remontdarbu darbinieki.

IMPORTANTI

STRUZZJONIJIET TAS-SIGURTÀ GĦALL-WIRING U L-INSTALLAZZJONI TAT-TAGĦMIR




L-istruzzjonijiet tas-sigurtà japplikaw speċifikament għall-Istati Membri ta' l-UE. Dawn għandhom jiġu osservati b'mod strett biex tkun żgurata l-konformità mad-Direttiva dwar il-Vultaġġ Baxx. Stati li mhumiex membri ta' l-UE għandhom ukoll ikunu konformi ma' dan li ġej hliel jekk dawn ikunu sostituti mill-Istandards lokali jew Nazzjonali.

1. Konnessjonijiet adegwati ta' l-ert għandhom isiru għall-punti kollha ta' l-ert, interni u esterni, fejn ikun ipprovdut.
2. Wara l-installazzjoni jew meta tipprova ssolvi xi problema, l-għatjien kollha tas-sigurtà u l-erts tas-sigurtà għandhom jitpoġġew lura f'pothom. L-integrità tat-terminali kollha ta' l-ert għandha tinżamm f'kull ħin.
3. Il-wajers tal-provvista tad-dawl għandhom ikunu konformi ml-ħtiġijiet ta' IEC227 jew IEC245.
4. Il-wiring kollu għandu jkun adattat għall-użu f'temperatura ta' l-ambjent ta' iktar minn 75°C.
5. Il-glands tal-kejbils kollha li jintużw iridu jkunu ta' daqs intern tali li jipprovdut ankoraġġ adegwat lill-kejbil.
6. Biex tiżgura t-tħaddim sigur ta' dan it-tagħmir, il-konnessjoni mal-provvista tad-dawl għandha ssir biss permezz ta' *circuit breaker* li jiskonna l-kondutturi kollha li jkunu jgħorru ċ-ċirkuwiti f'sitwazzjoni meta jkun hemm il-ħsara. Is-*circuit breaker* jista' wkoll jinkludi swiċċ li jiżola li jaħdem b'mod mekkaniku. Jekk dan ma jkunx il-każ, mezz ieħor ta' kif it-tagħmir jiġi skonnettjat minn mal-provvista tad-dawl għandu jkun ipprovdut, u jkun immrkat b'mod ċar li hu hekk. Is-*circuit breakers* jew swiċċijiet iridu jkunu konformi ma' standard rikonoxxut bħal IEC947. Il-wiring kollu jrid ikun konformi ma' l-istandards lokali, jekk ikun hemm.
7. Meta t-tagħmir jew l-għatjien ikunu mmarkati bis-simbolu fuq il-lemin, x'aktarx li jkun hemm vultaġġi perikolużi taħthom. Dawn l-għatjien għandhom jitneħħew biss meta titneħħa l-provvista tad-dawl mit-tagħmir - u minn ħaddiema tal-manutenzjoni mħarrġa biss. 
8. Meta t-tagħmir jew l-għatjien ikunu mmarkati bis-simbolu fuq il-lemin, ikun hemm periklu mill-uċuħ jaħarqu li jkun hemm taħthom. Dawn l-għatjien għandhom jitneħħew biss minn ħaddiema tal-manutenzjoni mħarrġa meta titneħħa l-provvista tad-dawl mit-tagħmir. Ċerti wċuħ jistgħu jibqgħu jaħarqu meta tmisshom. 
9. Meta t-tagħmir jew l-għatjien ikunu mmarkati bis-simbolu fuq il-lemin, irreferi għall-Manwal ta' l-Operatur għall-istruzzjonijiet.
10. Is-simboli grafiċi kollha użati f'dan il-prodott huma minn wieħed jew iktar mill-istandards li ġejjin: EN61010-1, IEC417, u ISO3864. 
11. Fejn it-tagħmir u t-tikketti huma mmarkati bil-kliem "Tiftaħx Meta Jkun Energizzat" jew kliem simili, hemm periklu ta' nar f'żoni fejn atmosfera esplosiva hi preżenti. It-tagħmir għandu jinfetaħ biss meta l-provvista tad-dawl tkun mitfija u jkun għadda ħin biżżejjed, kif speċifikat fuq it-tikketta jew fil-manwal ta' l-istruzzjonijiet, biex it-tagħmir ikun kesah – u t-tagħmir għandu jinfetaħ biss minn staff li jkun imħarreġ.

VIKTIG




Sikkerhetsinstruks for tilkobling og installasjon av dette utstyret.

Følgende sikkerhetsinstruksjoner gjelder spesifikt alle EU medlemsland og land med i EØS-avtalen. Instruksjonene skal følges nøye slik at installasjonen blir i henhold til lavspenningsdirektivet. Den bør også følges i andre land, med mindre annet er spesifisert av lokale- eller nasjonale standarder.

1. Passende jordforbindelser må tilkobles alle jordingspunkter, interne og eksterne hvor disse forefinnes.
2. Etter installasjon eller feilsøking skal alle sikkerhetsdeksler og jordforbindelser reetableres. Jordingsforbindelsene må alltid holdes i god stand.
3. Kabler fra spenningsforsyning skal oppfylle kravene spesifisert i IEC227 eller IEC245.
4. Alle ledningsforbindelser skal være konstruert for en omgivelsestemperatur høyere en 75°C.
5. Alle kabelforskrivninger som benyttes skal ha en indre dimensjon slik at tilstrekkelig avlastning oppnåes.
6. For å oppnå sikker drift og betjening skal forbindelsen til spenningsforsyningen bare skje gjennom en strømbryter (minimum 10A) som vil bryte spenningsforsyningen til alle elektriske kretser ved en feilsituasjon. Strømbryteren kan også inneholde en mekanisk operert bryter for å isolere instrumentet fra spenningsforsyningen. Dersom det ikke er en mekanisk operert bryter installert, må det være en annen måte å isolere utstyret fra spenningsforsyningen, og denne måten må være tydelig merket. Kretsbytere eller kontakter skal oppfylle kravene i en annerkjent standard av typen IEC947 eller tilsvarende.
7. Der hvor utstyr eller deksler er merket med symbol for farlig spenning, er det sannsynlig at disse er tilstede bak dekslet. Disse dekslene må bare fjernes når spenningsforsyning er frakoblet utstyret, og da bare av trenet servicepersonell. 
8. Der hvor utstyr eller deksler er merket med symbol for meget varm overflate, er det sannsynlig at disse er tilstede bak dekslet. Disse dekslene må bare fjernes når spenningsforsyning er frakoblet utstyret, og da bare av trenet servicepersonell. Noen overflater kan være for varme til å berøres i opp til 45 minutter etter spenningsforsyning frakoblet. 
9. Der hvor utstyret eller deksler er merket med symbol, vennligst referer til instruksjonsmanualen for instruks. 
10. Alle grafiske symboler brukt i dette produktet er fra en eller flere av følgende standarder: EN61010-1, IEC417 & ISO3864.
11. Når utstyr eller merkelapper bærer advarselen "Må ikke åpnes under spenning" eller lignende, innbærer det fare for eksplosjon i områder med en eksplosiv atmosfære. Utstyret skal bare åpnes når det ikke er noen strømtilførsel, og etter at det har hatt tilstrekkelig tid til å kjøle ned, som spesifisert på merkelappen eller i håndboken. Selv da skal utstyret bare åpnes av erfarne serviceteknikere.

WAŻNE!**Zalecenia dotyczące bezpieczeństwa w zakresie podłączania i instalacji tego urządzenia**




Następujące zalecenia dotyczą zwłaszcza stosowania urządzenia we wszystkich krajach Unii Europejskiej. Należy się ściśle do nich stosować w celu zapewnienia zgodności z dyrektywą niskonapięciową. W przypadku instalacji urządzenia w krajach nienależących do Unii Europejskiej należy również przestrzegać poniższych zaleceń, chyba że są one zastąpione lokalnymi lub ogólnokrajowymi standardami.

1. Urządzenie należy podłączyć kablem uziemiającym do wszystkich punktów uziemienia (wewnętrznych i zewnętrznych).
2. Po instalacji lub czynnościach serwisowych należy zamknąć wszystkie pokrywy zabezpieczające i ponownie podłączyć uziemienie. Należy pilnować, by nie doszło do przerwania uziemienia.
3. Przewody zasilające powinny być zgodne z wymaganiami normy IEC227 lub IEC245.
4. Wszystkie przewody powinny być odpowiednie do użytku w środowisku o temperaturze wyższej niż 75°C.
5. Wszystkie dławnice powinny mieć wymiary wewnętrzne zapewniające pewne umocowanie przewodów.
6. W celu zapewnienia bezpiecznej pracy urządzenie należy podłączyć do sieci tylko za pośrednictwem wyłącznika automatycznego, który w razie awarii odłączy wszystkie obwody, w których przepływa prąd. Wyłącznik automatyczny może być również wyposażony w mechaniczny odłącznik napięcia. W przeciwnym razie należy zapewnić i jasno oznaczyć inną możliwość odłączenia urządzenia od zasilania. Wyłączniki automatyczne oraz odłączniki powinny być zgodne z uznawanymi standardami, takimi jak norma IEC947. Wszystkie przewody muszą być zgodne z lokalnymi przepisami.
7. Pod pokrywami lub elementami urządzenia oznaczonymi symbolem pokazanym na rysunku po prawej stronie może występować niebezpieczne napięcie elektryczne. Te pokrywy mogą być zdejmowane tylko po odłączeniu zasilania, wyłącznie przez odpowiednio przeszkolonych pracowników serwisu. 
8. Pod pokrywami lub elementami urządzenia oznaczonymi symbolem pokazanym na rysunku po prawej stronie znajdują się gorące powierzchnie. Te pokrywy mogą być zdejmowane tylko po odłączeniu zasilania, wyłącznie przez odpowiednio przeszkolonych pracowników serwisu. Niektóre powierzchnie mogą pozostać nagrzane przez pewien czas po odłączeniu zasilania. 
9. W przypadku sprzętu oraz pokryw oznaczonych symbolem pokazanym na rysunku po prawej stronie należy zapoznać się ze wskazówkami w Instrukcji operatora i stosować się do nich. 
10. Wszystkie symbole graficzne zastosowane do oznaczenia produktu pochodzą z następujących norm: EN61010-1, IEC417 lub ISO3864.
11. Oznaczenie „Nie otwierać, gdy urządzenie jest pod napięciem” lub podobne oznaczenia informują o ryzyku zapłonu w miejscach, gdzie występuje zagrożenie wybuchem. Urządzenie należy otwierać tylko po odłączeniu zasilania i po upływie czasu na ostygnięcie urządzenia oznaczonego na etykiecie lub w instrukcji obsługi. Urządzenie mogą otwierać wyłącznie odpowiednio przeszkoleni pracownicy serwisu.

IMPORTANTE

Instruções de segurança para ligação e instalação deste aparelho.

As seguintes instruções de segurança aplicam-se especificamente a todos os estados membros da UE. Devem ser observadas rigidamente por forma a garantir o cumprimento da Directiva sobre Baixa Tensão. Relativamente aos estados que não pertençam à UE, deverão cumprir igualmente a referida directiva, exceptuando os casos em que a legislação local a tiver substituído.

1. Devem ser feitas ligações de terra apropriadas a todos os pontos de terra, internos ou externos.
2. Após a instalação ou eventual reparação, devem ser recolocadas todas as tampas de segurança e terras de protecção. Deve manter-se sempre a integridade de todos os terminais de terra.
3. Os cabos de alimentação eléctrica devem obedecer às exigências das normas IEC227 ou IEC245.
4. Os cabos e fios utilizados nas ligações eléctricas devem ser adequados para utilização a uma temperatura ambiente até 75°C.
5. As dimensões internas dos buçins dos cabos devem ser adequadas a uma boa fixação dos cabos.
6. Para assegurar um funcionamento seguro deste equipamento, a ligação ao cabo de alimentação eléctrica deve ser feita através de um disjuntor (min. 10A) que desligará todos os condutores de circuitos durante uma avaria. O disjuntor poderá também conter um interruptor de isolamento accionado manualmente. Caso contrário, deverá ser instalado qualquer outro meio para desligar o equipamento da energia eléctrica, devendo ser assinalado convenientemente. Os disjuntores ou interruptores devem obedecer a uma norma reconhecida, tipo IEC947.
7. Sempre que o equipamento ou as tampas contiverem o símbolo, é provável a existência de tensões perigosas. Estas tampas só devem ser retiradas quando a energia eléctrica tiver sido desligada e por Pessoal da Assistência devidamente treinado. 
8. Sempre que o equipamento ou as tampas contiverem o símbolo, há perigo de existência de superfícies quentes. Estas tampas só devem ser retiradas por Pessoal da Assistência devidamente treinado e depois de a energia eléctrica ter sido desligada. Algumas superfícies permanecem quentes até 45 minutos depois. 
9. Sempre que o equipamento ou as tampas contiverem o símbolo, o Manual de Funcionamento deve ser consultado para obtenção das necessárias instruções. 
10. Todos os símbolos gráficos utilizados neste produto baseiam-se em uma ou mais das seguintes normas: EN61010-1, IEC417 e ISO3864.
11. Sempre que o equipamento ou as etiquetas apresentarem o aviso "Não abrir quando ligado à corrente" ou semelhante, existe um risco de ignição em atmosferas explosivas. Este equipamento só deve ser aberto depois de desligado da corrente eléctrica e o tempo de arrefecimento adequado especificado na etiqueta ou no manual de instruções ter decorrido. O equipamento só pode ser aberto por técnicos qualificados.

DÔLEŽITÉ

Bezpečnostné pokyny pre zapojenie káblov a inštaláciu tohto prístroja

Nasledovné bezpečnostné pokyny sa vzťahujú konkrétne na všetky členské štáty EÚ. Musia byť striktne dodržané, aby sa zaistila zhoda so Smernicou o nízkom napätí. Štáty, ktoré nie sú členskými štátmi EÚ by mali nasledovné pokyny taktiež dodržiavať, pokiaľ nie sú nahradené miestnymi alebo národnými normami.




1. Adekvátne uzemnenia musia byť vykonané na všetkých bodoch uzemnenia, interných aj externých, tam, kde sú poskytnuté.
2. Po inštalácii alebo riešení problémov musia byť všetky bezpečnostné kryty a bezpečnostné uzemnenia vymenené. Integrita všetkých uzemňovacích terminálov musí byť vždy zachovaná.
3. Káble sieťového napájania musia byť v zhode s požiadavkami IEC227 alebo IEC245.
4. Všetky káblové pripojenia by mali byť vhodné pre používanie v teplote okolia vyššej, ako 75°C.
5. Všetky použité káblové priechodky musia mať také vnútorné rozmery, aby poskytovali adekvátne uchopenie kábla.
6. Pre zaistenie bezpečnej prevádzky tohto zariadenia musí byť pripojenie k sieťovému napájaniu zapojené len cez prerušovač obvodu, ktorý počas poruchovej situácie odpojí všetky obvody elektrických vodičov. Prerušovač obvodu by mal obsahovať aj mechanicky ovládaný úsekový vypínač. Ak nie, musí byť poskytnutý iný spôsob odpojenia zariadenia od sieťového napájania a tento spôsob musí byť zreteľne označený. Prerušovače obvodu alebo spínače musia byť v zhode s uznanou normou, ako napr. IEC947. Všetky káblové pripojenia musia vyhovovať akýmkoľvek miestnym normám.
7. Tam, kde je zariadenie alebo kryty označené symbolom na pravej strane, sa pravdepodobne nachádza nebezpečné napätie. Tieto kryty by sa mali odoberať len vtedy, keď je zariadenie odpojené od elektrickej energie a len vyškoleným servisným personálom.
8. Tam, kde je zariadenie alebo kryty označené symbolom na pravej strane, existuje nebezpečenstvo horúcich povrchov. Tieto kryty by mali byť odstraňované len vyškoleným servisným personálom, pričom je zariadenie odpojené od elektrickej energie. Určité povrchy môžu ostať horúce na dotyk.
9. V miestach, kde je zariadenie alebo kryty označené symbolom na pravej strane, si kvôli pokynom pozrite Operátorskú príručku.
10. Všetky obrázkové symboly použité pri tomto produkte zodpovedajú jednej alebo viacerým nasledujúcim normám: EN61010-1, IEC417 a ISO3864.
11. V miestach, kde je zariadenie alebo značky označené nápisom "Neotvárať pod elektrickým prúdom" alebo podobné, existuje nebezpečenstvo vznietenia v oblastiach s prítomnosťou výbušného ovzdušia. Toto zariadenie sa smie otvárať len v prípade odpojenia od elektrického napájania a ponechania zariadenia vychladnúť po dobu uplynutia dostatočného času tak, ako je to uvedené na štítku alebo v návode na použitie - a len vyškoleným servisným personálom.



POMEMBNO

Varnostna navodila za povezavo in vgradnjo naprave

Naslednja varnostna navodila veljajo za vse države članice EU. Zaradi zagotovitve skladnosti z nizkonapetostno direktivo morate navodila strogo upoštevati. V državah, ki niso članice EU, je treba upoštevati tudi naslednje smernice, razen če jih ne zamenjujejo lokalni ali nacionalnimi standardi.

1. Do vseh ozemljitvenih točk, notranjih in zunanjih, ki so na voljo, morajo biti speljane ustrezne ozemljitvene povezave.
2. Po vgradnji ali odpravljanju težav je treba namestiti vse varnostne pokrove in zaščitne ozemljitve. Brezhibnost vseh ozemljitvenih priključkov je treba nenehno preverjati.
3. Omrežni napajalni kabli morajo biti skladni z zahtevami standarda IEC227 ali IEC245.
4. Vsa napeljava mora biti primerna za uporabi pri temperaturi okolja, višji od 75°C.
5. Notranje dimenzije kabelskih tesnilk morajo zagotavljati ustrezno pritrditev kablov.
6. Za zagotovitev varnega delovanja opreme mora biti povezava z omrežnim napajanjem vzpostavljena prek odklopnega stikala, ki v primeru napake izklopi vse tokokroge s prevodniki. Odklopno stikalo lahko vključuje tudi mehansko izolacijsko stikalo. V nasprotnem primeru morajo biti zagotovljeni in jasno označeni drugi načini za izklop opreme iz napajanja. Odklopna in druga stikala morajo biti skladna z uveljavljenimi standardi, kot je IEC947. Vsa napeljava mora biti skladna z lokalnimi standardi.
7. V opremi ali pod pokrovi, ki so označeni s simbolom na desni, je prisotna nevarna napetost. Te pokrove je dovoljeno odstraniti samo, če je napajanje opreme izklopljeno. To lahko izvaja samo usposobljeno servisno osebje. 
8. Pri opremi ali pod pokrovi, ki so označeni s simbolom na desni, so prisotne nevarne vroče površine. Te pokrove lahko odstranjuje samo usposobljeno servisno osebje. Napajanje opreme mora biti izklopljeno. Določene površine so lahko vroče. 
9. Pri opremi ali pokrovi, ki so označeni s simbolom na desni, si za navodila oglejte priročnik za upravljanje. 
10. Vsi uporabljeni grafični simboli so iz enega ali več naslednjih standardov: EN61010-1, IEC417 in ISO3864.
11. Če je na opremi ali oznakah navedeno "Ne odpirajte, če je pod napetostjo" ali podobno opozorilo, je na območjih z eksplozivnim ozračjem prisotna nevarnost vžiga. To opremo je dovoljeno odpirati samo, če je napajanje izklopljeno in je poteklo dovolj časa, da se oprema ohladi, kot je navedeno na oznaki ali v priročniku z navodili. Opremo lahko odpira samo usposobljeno servisno osebje.

IMPORTANTE

Instrucciones de seguridad para el montaje y cableado de este aparato.

Las siguientes instrucciones de seguridad, son de aplicacion especifica a todos los miembros de la UE y se adjuntaran para cumplir la normativa europea de baja tension.




1. Se deben preveer conexiones a tierra del equipo, tanto externa como internamente, en aquellos terminales previstos al efecto.
2. Una vez finalizada las operaciones de mantenimiento del equipo, se deben volver a colocar las cubiertas de seguridad aasi como los terminales de tierra. Se debe comprobar la integridad de cada terminal.
3. Los cables de alimentacion electrica cumplan con las normas IEC 227 o IEC 245.
4. Todo el cableado sera adecuado para una temperatura ambiental de 75°C.
5. Todos los prensaestopas seran adecuados para una fijacion adecuada de los cables.
6. Para un manejo seguro del equipo, la alimentacion electrica se realizara a traves de un interruptor magnetotermico (min 10 A), el cual desconectara la alimentacion electrica al equipo en todas sus fases durante un fallo. Los interruptores estaran de acuerdo a la norma IEC 947 u otra de reconocido prestigio.
7. Cuando las tapas o el equipo lleve impreso el simbolo de tension electrica peligrosa, dicho alojamiento solamente se abra una vez que se haya interrumpido la alimentacion electrica al equipo asimismo la intervencion sera llevada a cabo por personal entrenado para estas labores.
8. Cuando las tapas o el equipo lleve impreso el simbolo, hay superficies con alta temperatura, por tanto se abra una vez que se haya interrumpido la alimentacion electrica al equipo por personal entrenado para estas labores, y al menos se esperara unos 45 minutos para enfriar las superficies calientes.
9. Cuando el equipo o la tapa lleve impreso el simbolo, se consultara el manual de instrucciones.
10. Todos los simbolos graficos usados en esta hoja, estan de acuerdo a las siguientes normas EN61010-1, IEC417 & ISO 3864.
11. Cuando el equipo o las etiquetas tienen la indicación " No abrir mientras reciba energía" u otra similar, existe el peligro de ignición en zonas donde haya un ambiente explosivo. Este equipo sólo debe ser abierto por personal de servicio cualificado después de apagarlo y dejar pasar el intervalo de tiempo correspondiente indicado en la etiqueta o el manual de instrucciones para que el equipo se enfríe.



VIKTIGT

Säkerhetsföreskrifter för kablage och installation av denna apparat.

Följande säkerhetsföreskrifter är tillämpliga för samtliga EU-medlemsländer. De skall följas i varje avseende för att överensstämma med Lågspännings direktivet. Icke EU medlemsländer skall också följa nedanstående punkter, såvida de inte övergrips av lokala eller nationella föreskrifter.

1. Tillämplig jordkontakt skall utföras till alla jordade punkter, såväl internt som externt där så erfordras.
2. Efter installation eller felsökning skall samtliga säkerhetshöljen och säkerhetsjord återplaceras. Samtliga jordterminaler måste hållas obrutna hela tiden.
3. Matningsspänningens kabel måste överensstämma med föreskrifterna i IEC227 eller IEC245.
4. Allt kablage skall vara lämpligt för användning i en omgivningstemperatur högre än 75°C.
5. Alla kabelförskruvningar som används skall ha inre dimensioner som motsvarar adekvat kabelförankring.
6. För att säkerställa säker drift av denna utrustning skall anslutning till huvudströmmen endast göras genom en säkring (min 10A) som skall fränkoppla alla strömförande kretsar när något fel uppstår. Säkringen kan även ha en mekanisk fränskiljare. Om så inte är fallet, måste ett annat förfarande för att fränskilja utrustningen från strömförsörjning tillhandahållas och klart framgå genom markering. Säkring eller omkopplare måste överensstämma med en gällande standard såsom t ex IEC947.
7. Där utrustning eller hölje är markerad med vidstående symbol föreligger risk för livsfarlig spänning i närheten. Dessa höljen får endast avlägsnas när strömmen ej är ansluten till utrustningen - och då endast av utbildad servicepersonal. 
8. När utrustning eller hölje är markerad med vidstående symbol föreligger risk för brännskada vid kontakt med uppvärmd yta. Dessa höljen får endast avlägsnas av utbildad servicepersonal, när strömmen kopplats från utrustningen. Vissa ytor kan vara mycket varma att vidröra även upp till 45 minuter efter avstängning av strömmen. 
9. När utrustning eller hölje markerats med vidstående symbol bör instruktionsmanualen studeras för information. 
10. Samtliga grafiska symboler som förekommer i denna produkt finns angivna i en eller flera av följande föreskrifter:- EN61010-1, IEC417 & ISO3864.
11. För utrustning som markerats med föreskrifter som "Öppna inte när strömmen är på", eller liknande, råder explosionsrisk när det förekommer explosiva ångor. Utrustningen får endast öppnas efter att strömmen stängts av och efter att utrustningen fått svalna under så lång tid som anges i instruktionsboken. Öppnandet får endast utföras av utbildad servicepersonal.

Appendix C Return of Material

RETURNING MATERIAL

If factory repair of defective equipment is required, proceed as follows:

1. Secure a return authorization number from a Emerson Process Management Sales Office or representative before returning the equipment. Equipment must be returned with complete identification in accordance with Emerson Process Management instructions or it will not be accepted.

In no event will Emerson Process Management be responsible for equipment returned without proper authorization and identification.

CAUTION

Observe proper ESD handling and packaging precautions when returning individual circuit boards.

2. Carefully pack defective unit in a sturdy box with sufficient shock absorbing material to ensure that no additional damage will occur during shipping. When returning individual circuit boards, observe proper ESD precautions.
3. In a cover letter, describe completely:
 - a. The symptoms from which it was determined that the equipment is faulty.
 - b. The environment in which the equipment has been operating (housing, weather, vibration, dust, etc.).
 - c. Site from which equipment was removed.
 - d. Whether warranty or nonwarranty service is requested.
- e. Complete shipping instructions for return of equipment.
- f. Reference the return authorization number.
4. Enclose a cover letter and purchase order and ship the defective equipment according to instructions provided in Emerson Process Management Return Authorization, prepaid, to:

Emerson Process Management
RMR Department
Daniel Headquarters
11100 Britmore Park Drive
Houston, TX 77041

If warranty service is requested, the defective unit will be carefully inspected and tested at the factory. If failure was due to conditions listed in the standard Rosemount Analytical warranty, the defective unit will be repaired or replaced at Emerson Process Management's option, and an operating unit will be returned to the customer in accordance with shipping instructions furnished in the cover letter.

For equipment no longer under warranty, the equipment will be repaired at the factory and returned as directed by the purchase order and shipping instructions.

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WARRANTY

Rosemount Analytical warrants that the equipment manufactured and sold by it will, upon shipment, be free of defects in workmanship or material. Should any failure to conform to this warranty become apparent during a period of one year after the date of shipment, Rosemount Analytical shall, upon prompt written notice from the purchaser, correct such nonconformity by repair or replacement, F.O.B. factory of the defective part or parts. Correction in the manner provided above shall constitute a fulfillment of all liabilities of Rosemount Analytical with respect to the quality of the equipment.

THE FOREGOING WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF QUALITY WHETHER WRITTEN, ORAL, OR IMPLIED (INCLUDING ANY WARRANTY OF MERCHANTABILITY OF FITNESS FOR PURPOSE).

The remedy(ies) provided above shall be purchaser's sole remedy(ies) for any failure of Rosemount Analytical to comply with the warranty provisions, whether claims by the purchaser are based in contract or in tort (including negligence).

Rosemount Analytical does not warrant equipment against normal deterioration due to environment. Factors such as corrosive gases and solid particulates can be detrimental and can create the need for repair or replacement as part of normal wear and tear during the warranty period.

Equipment supplied by Rosemount Analytical Inc. but not manufactured by it will be subject to the same warranty as is extended to Rosemount Analytical by the original manufacturer.

At the time of installation it is important that the required services are supplied to the system and that the electronic controller is set up at least to the point where it is controlling the sensor heater. This will ensure, that should there be a delay between installation and full commissioning that the sensor being supplied with ac power and reference air will not be subjected to component deterioration.

Xi Advanced Electronics
Part no. _____
Serial no. _____
Order no. _____

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All other marks are the property of their respective owners.*

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